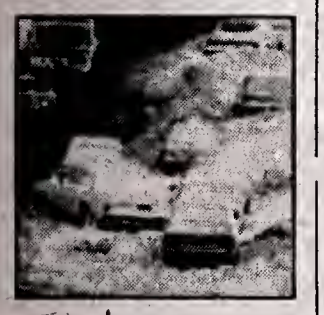
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

$2.00 A COPY; $44/YEAR | APRIL 9, 1984 | VOL. XVIII, NO. 15



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DEC introduces its first relational DBMS

By John Gallant
CW Staff

NEW YORK — Digital Equipment Corp. turned over the first cards in its relational data base management system hand when it held a press conference here last week to introduce two packages for its VAX line of processors.

The company also unveiled the VAX-11/785, a mid-life kicker for its high-end VAX-11 supermini series, and launched its first attempt at breaking into the videotex market, with a $25,000 software package called VAX VTX (stories on page 6).

The VAX RDB/VMS and VAX RDB/ELN packages are the first to be announced in DEC's planned line of relational DBMS products, a spokeswoman said. They run on the entire line of VAX processors, ranging from the high-end VAX-11/785 down to the Microvax I.

VAX RDB/VMS reportedly runs on all VMS-based computers and is an integrated component of DEC's VAX information architecture. The VAX RDB/ELN package was developed for small and mid-size VAX processors in the dedicated or distributed DEC VAX/ELN execution environment; it is targeted at dedicated applications requiring time-critical data manipulation and analysis.

See **DEC** page 7

IBM moves to mitigate compatibility snags

By John Dix
CW Staff

IBM last week announced a barrage of products aimed at mitigating the problem of incompatibility among its low-end computer systems, then rounded out the announcements with the introduction of a low-end System/36.

While industry watchers heralded as important various aspects of the multifaceted announcement (stories on page 8), almost all agreed that the most significant were the products targeted at integrating IBM's low-end systems — particularly the Personal Computer — with larger systems.

In announcing the integration products, IBM was "coming through on a promise of a couple of years ago to tie together its low-end products," said Harry Edelson, a vice-president with First Boston, Inc., a New York investment firm. "This adds utility to all of its low-end products."

Gordon Casey, vice-president of the Drexel, Burnham and Lambert Group, another New York-based investment house, said the basic thrust of the announcement was to "continue to fill in the gaps for existing customers with [IBM] 5520s, Displaywriters and [Personal Computers]."

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TOP OF THE NEWS

If you're among the 16,000 or 17,000 waiting for Wats, 800, private-line or other special services, there may be hope. AT&T just reassigned 1,000 employees to tackle the backlog. **Page 2.**

■

The "KGB Relief Act of 1983" is what the U.S. Commissioner of Customs called the House of Representatives' proposed renewal of the Export Administration Act. **Page 4.**

■

A federal grand jury last week indicted two U.S. and several foreign firms for allegedly shipping equipment made by Digital Equipment Corp. and Hewlett-Packard Co. to the Soviets. **Page 5.**

■

The insurgent stockholder who just won four of the 10 seats on Management Assistance, Inc.'s board told *Computerworld* last week that his goal is to sell the $376 million company and force its chairman out of office. **Page 9.**

■

Software that covers the full scope of lending activities has been announced for users of IBM processors by Hogan Systems, Inc. **Page 77.**

■

In hardware news, Nixdorf Computer Corp. announced a high-end addition to its 8870 line of general business computers, and Four-Phase Systems, Inc. launched a 32-bit, Unix-based office system. **Page 101.**

■

A portable micro that features a hard disk and compatibility with the IBM Personal Computer has been introduced by Corona Data Systems, Inc. **Page 117.**

■

IRS having budget problems as tax day draws near

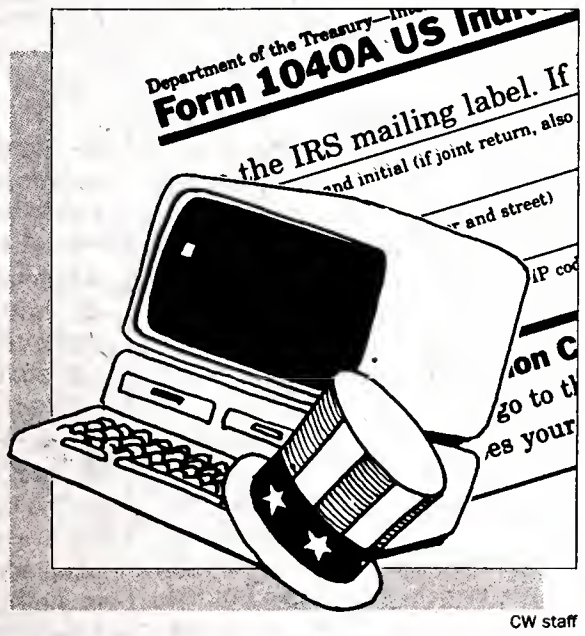
By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Congress wants to give the Internal Revenue Service what it's asking for in the form of computers to beef up its revenue collection, but the Reagan budget planners are seeking to take it away.

Originally, the IRS sought $129 million in automated data processing modernization for the fiscal year starting in October. The Office of Management and Budget, the executive agency responsible for the budget revisions, cut that figure to $50 million, prompting howls of concern.

In a letter last January to Secretary of the Treasury Donald Regan, IRS Commissioner Roscoe Egger bemoaned the projected cuts in the IRS budget. "At a minimum," Egger told Regan, "the cuts will cripple the progress already made."

Egger said the IRS, in the midst of a five-year system replacement schedule, could not carry out its functions without a minimum of $104 million for DP upgrades. But OMB was not convinced. It restored some funds, but only $14 million, so the IRS now has a budget of $64 million for DP modernization.



CW staff

Rep. Doug Barnard Jr. (D-Ga.), chairman of the House of Representatives Subcommittee on Commerce, Consumer and Monetary Affairs, which oversees the IRS, charged recently that the budget cutbacks called for by OMB will result in lost tax revenues. Barnard said $3 billion that should be collected by the IRS will not be collected because of the cutbacks in the IRS computer modernization program. Instead of collecting about $36.8 billion in revenue in fiscal 1985, according to Barnard, the IRS will collect only $33.8 billion.

"We can only deduce that, in fact, the IRS will be crippled in its tax collection functions," commented Dean Scott, a staff official of the subcommittee. "Computer matching will be set back, and the fact that [the IRS] will be collecting 200 million new information documents as a result of new legal requirements probably means they will need greater operator resources."

Congress has been ready to appropriate money toward the modernization of the IRS' returns processing, in view of the massive projections of uncollected revenues from the so-called underground econ-

See **IRS** page 4

NEWSPAPER

AT&T trying to cut backlog

Reassigns 1,000 employees

By John Dix
CW Staff

NEW YORK — AT&T Communications reassigned 1,000 employees last week in an effort to tackle the backlog beast that has been plaguing its order-processing procedures and causing installation delays for its Wats, 800, private-line and other special services.

By the middle of last month, 16,000 to 17,000 special service orders (including private-line orders) were backlogged, a company spokesman said. This equates with a month's worth of work — meaning that if the company stopped taking orders and focused on the backlog alone, it would take a month to catch up.

Similarly, 20,000 orders for Wats and 800 service — representing two weeks' worth of work — have been pushed to the back burner.

The spokesman predicted that the Wats/800 backlog would be dried up within the next couple of months, but would not venture a guess when orders for special services would be filled. The backlogs vary because Wats/800 services involve only one network point of contact, whereas point-to-point and multipoint private lines must be engineered through to other locations, typically requiring the coordination of at least two telephone operating companies.

In a formal response to an inquiry from the Federal Communications Commission, AT&T corporate vice-president Dan Culkin recently wrote that the company would address the service delay problems by bolstering its "provisioning process." This process begins when an order is taken and includes the time it takes to engineer the requested service and install the actual line.

The 1,000 reassigned personnel are being employed at the front end of this process, the spokesman said. To back them up, Culkin told the FCC that AT&T's computer system (comprising roughly 40 systems) would be made available on an extended basis.

Last week, the AT&T computer system became operational 16 hours a day, five days a week and six hours on Saturday, the spokesman said.

User horror stories

Meanwhile, user horror stories continue to mount.

Allen Dyer of CWT Specialty Stores in Providence, R.I., said that when he tried to place an order for a 2,400 bit/sec Dataphone Digital Service (DDS) line, he was given the runaround between New York and Boston, only to learn that his records presumably had been destroyed.

But Dyer sees light at the end of the tunnel. After going through seven account representatives in January, CWT Specialties was assigned a representative who did a lot of leg work to rectify the problem, and the quoted installation date for its 2,400 bit/sec DDS circuit was reduced from 83 days to 62 days.

Another user, Doug Jackson of Linclay Corp., a real estate developer, was told his four-point DDS circuit would be installed in 57 working days. Eighty days later, there was still no sign of an installation crew.

Dyer, Jackson and others experiencing lengthy installation delay problems will be happy to hear there is a toll-free number customers can call to complain. To verify that number — 1-800-222-0400 — for publication, *Computerworld* gave it a try.

It was never answered.

AT&T asks FCC for looser rein; cites drop in business as reason

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Contending that it has lost nearly four million customers to competitors in the last three years, AT&T last week asked for less regulation of its activities by the Federal Communications Commission.

Reduced regulation will lead to lower rates, more customer choice and faster introduction of new technology, said Al Partoll, executive vice-president of AT&T Communications, Inc. He added that because of AT&T's divestiture, the company has greatly reduced assets, no longer controls local exchange facilities, lacks the monopoly market power of the former Bell system and, therefore, doesn't need to be regulated as much as its predecessor.

Specifically, AT&T Communications wants to offer new services without having to submit extensive cost information and wait for the commission to review it — a process that may take several months. The company also wants to construct new facilities without getting the commission's prior approval and to earn a return on its investment that is determined by the market rather than the FCC.

AT&T's request came as part of its reply to an FCC notice of inquiry of last October regarding long-term regulation of AT&T's domestic interstate phone service.

AT&T Communications estimated that its "direct expenditures alone resulting from regulation may reach $250 million per year." Partoll pointed out that it took the FCC 103 days to approve AT&T's proposals for optional calling plans; because of that delay, he said, the company's competitors were able to get to the market first with plans of their own.

The International Communications Association (ICA), a users group representing several of the nation's largest companies, also submitted comments to the FCC's notice of inquiry. In essence, the ICA claimed the FCC should continue regulating AT&T as long as the company has significant market power.

This regulation, the ICA added, should not come at considerable expense to AT&T, as such expenses will be passed on to users.

NEWS SUMMARY

The House of Representatives' proposed renewal of the Export Administration Act poses a threat to Operation Exodus, says the U.S. Commissioner of Customs/**4**

Equipped with portable computers, IRS field agents in Worcester, Mass., will begin calling on taxpayers to complete audits/**4**

Two U.S. and several foreign firms have been indicted for allegedly shipping sophisticated Hewlett-Packard Co. and Digital Equipment Corp. equipment to the Soviets/**5**

Digital Equipment Corp. has announced the VAX-11/785, which boasts up to 50% more performance than the older VAX-11/780 at a 15% higher cost/**6**

Digital Equipment Corp.'s move into the relational data base management system arena signals renewed focus on software in general and on the information center in particular/**7**

IBM last week issued a barrage of products, most aimed at linking its Personal Computers to larger IBM machines. The company also brought out a low-end System/36/**8**

Stockholder Asher Edelman won a proxy fight with Management Assistance, Inc. and vows to oust company chairman Raymond Kurshan/**9**

Senior managers' expectations of quickly mastering microcomputers should be tempered, attendees at a forum sponsored by Future Computing, Inc. last week in Dallas were told/**10**

Microcomputer-to-mainframe computer links have a long way to go to meet user needs, according to analysts and vendors at the Fortune 1,000 Personal Computer Market Forum/**10**

CW at the Electronic Funds Transfer Association Convention: Attendees were told to move personal computers out of banks' back offices into positions where they can serve as marketing tools . . . Limits need to be set on access to computerized funds transfers . . . The divestiture of AT&T will translate into skyrocketing communications rates and poorer service for users of bank and retail electronic funds transfer nets, the conference-goers were told/**11-13**

DP managers tell how they braved the storms that ravaged the East Coast as March ended/**14**

A federal appeals court in San Francisco has reinstated charges against three defendants who allegedly tried to sell stolen IBM systems technology to Tokyo-based Hitachi Ltd./**16**

Product Spotlight: Microprocessors — the heart of the micro revolution/**15**

Massachusetts Gov. Michael Dukakis is slated to present the state legislature with a computer crime bill that is being hailed as one of the nation's most comprehensive pieces of legislation/**19**

Modern technology has entered the 1984 Summer Olympics/**24**

A major U.S. soft drink company will use a microcomputer network when it hosts up to 1,000 guests daily at next summer's Olympic Games/**25**

A Mississippi state court has ordered the state to sell for $400 a computerized mailing list for which the state had wanted to charge $85,000/**26**

Not for those whose reading tastes lean toward private eye potboilers, Computer Literacy is a bookstore that caters exclusively to MIS professionals and microelectronics designers/**32**

Three people who have been charged with conspiracy to trade securities in New York allegedly used word processing equipment to break into a law firm's confidential computerized files/**33**

DP trainers who do not plan strategically for the implementation of computer-based training will likely lose their ability to control, manage and adapt to this change in instruction, an assistant vice-president of a Los Angeles bank warns/**34**

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An Atlanta bank is wooing wealthy customers by using a data base management program to provide highly personalized service/**37**

A paper trading firm's custom software package helps it manage daily operations and accommodate a 50% volume increase/**43**

A group of community colleges is preparing its students for the job market by replacing an obsolete remote job entry terminal system with an interactive, on-line system/**44**

A software package is helping a publishing company ensure that subscribers remain on the circulation list/**45**

A chemical manufacturer has developed a cost-effective computer-assisted retrieval system for use in its home office/**49**

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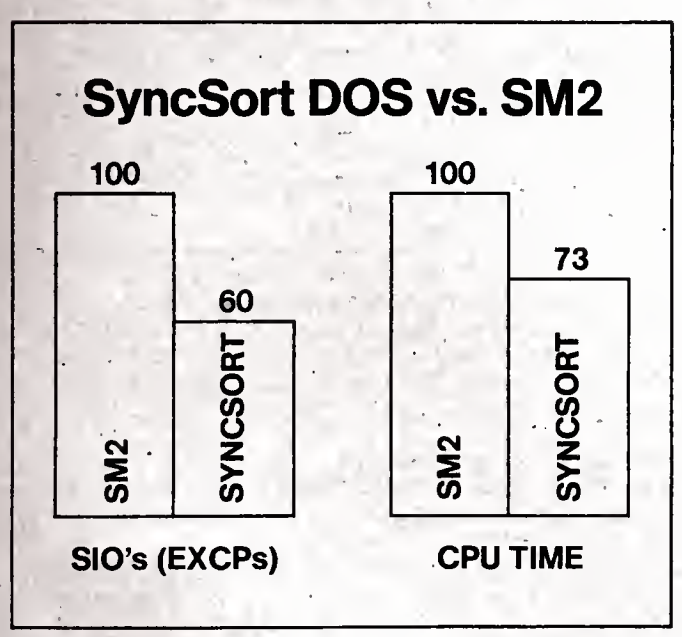
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IN-LAWS

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—Old Chinese Proverb.

* * * *

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NEWS

Customs chief blasts House version of Export Act

By Patricia Keefe
CW Staff

BOSTON — The Bonker Bill, the House of Representatives' proposed version of the Export Administration Act, is best characterized as the "KGB Relief Act of 1983," charged the U.S. Commissioner of Customs, who recently asserted "it would be a disaster if it ever became law."

Commissioner William von Raab made those remarks here before the Symposium on the Transfer of Technology in the International Marketplace, which was sponsored here recently by the Federal Bar Association.

The Bonker bill, named for Rep. Don Bonker (D-Wash.), would "virtually strip customs of its authority to inspect export shipments except under very special circumstances," von Raab charged.

"I have spoken out against the bill many times and have stated my alarm and distress at the prospect of such legislation," he said, adding that "those of us who see the dangers inherent in the theft of our critical technology are pulling for the Senate bill [to renew the Export Administration Act, which expired last September]." A House-Senate conference two weeks ago began hammering out the differences between the two bills.

Customs favors the Senate bill because it would allow customs to continue with Operation Exodus, a program that has resulted in hundreds of arrests and convictions for illegal technology exports. "Those of us who are pledged to protecting America's technological superiority see Exodus as a practical solution," von Raab said. "We believe in keeping our guard up. We believe that Exodus is a wise precaution in a dangerous world."

Operation Exodus is especially important today, he said, because the latest technology tends to be developed in the civilian sector, where it is not protected by national security laws. As a result, this technology is much more accessible to the Soviets and their American recruits, he said.

Further, many of the latest products are both easy to smuggle and very valuable, according to von Raab. With an estimated 200 weapons systems on Soviet drawing boards requiring U.S. technological know-how, "we can expect [the Soviets] to come shopping."

Suggesting that the overall intent of the Bonker bill is to speed trade without restriction, von Raab asked that it be done in such a way that it does not limit the authority of the government or customs to stop the theft of technology goods and secrets. "We are serious about helping manufacturers avoid unnecessary delays in exporting their high-technology products," he said.

Von Raab claimed that while industry is not happy about any delays caused by customs' inspection program, "they are just as anxious as we are to keep the Soviet Union from getting their hands on American technology."

Stressing that this is the only aim of Operation Exodus, von Raab said that "if in the process we cause some inconvenience, it seems to me a small price to pay." He claimed that only 2% of export shipments suffer any delay and that the people most affected by the delays, the manufacturers, seem to agree that the delays are necessary.

IRS from page 1

omy as well as unreported income contributing to the federal budget deficit.

In recent years, Congress has passed laws, such as the Tax Equity and Fiscal Responsibility Act, which require employers and financial institutions to file information on individuals that was not required before. The IRS will process this additional information for the first time this spring as individual tax returns start flowing into the 10 IRS service centers scattered across the country. The information from employers and financial institutions was due at the agency Feb. 28.

Since 1978, computerized matching of the information filed by individuals and employers has been carried out by the IRS. However, there has been little matching of information filed on 1099s, which carry interest and dividend information with individual tax returns. This year, however, a large percentage of 1099 information filed on magnetic tapes or disks will face a computer match.

The major problem that has faced the IRS has been inaccurate information filed by either the employer or the individual, mainly the taxpayer's identification number. Correcting this information takes time, according to the IRS. Fourteen months elapse from the time the data is first filed to the time a case of underreported or incorrect tax return information is uncovered. It then takes 12 months more before the regional center completes action on a case.

The General Accounting Office, the investigative arm of Congress, wrote a report on the state of computer technology at the IRS and concluded that substantial additional resources will be needed for the IRS to process the increased work load.

The projected budget cuts slated by OMB have prompted congressional concern that the IRS will not be able to crack down on tax cheats or use the new information returns. However, an OMB spokesman said the IRS will receive a budget increase in fiscal 1985. An IRS spokesman confirmed this, noting the increase for fiscal 1985 was $205 million.

IRS field agents showing up for audits with portables

By Paul Korzeniowski
CW Staff

WORCESTER, Mass. — Internal Revenue Service field agents here are hopeful that replacing calculators with portable computers will hasten the slow, arduous auditing process.

"An audit can take as long as four hours," said John D. Johnson, director of the IRS' Boston district, which includes New England and part of New York. "The use of portable computers will cut that time considerably."

The Worcester field office is serving as a test site for a possible nationwide implementation of portable computers. If the experiment is successful, portable computers will become standard equipment for 12,000 IRS field agents next year.

Field test

A dozen field agents in the Worcester office and four agents in Worcester's suboffice in Springfield, Mass., will take part in the test.

Agents will load taxpayer records from the Boston district's central files, stored on a Zilog, Inc. 8000 minicomputer in Andover, Mass., into the portables. Agents will then walk into a taxpayer's office, place the portable on a desk and use spreadsheet and financial analysis programs to review 1982 and 1983 tax bills.

"A lot of our work is done with spreadsheets," Johnson said. "Sometimes an agent would forget a number or a formula. Rather than recompile the figures, he may not correct the mistake. This system will make agents more efficient."

The Boston district will decide by April 15 the type of portable computer to be used.

"We have looked at more than 100 portable computers," Johnson said. "We require one that is truly portable. One of the field agents weighs only 90 pounds, and she has to be able to carry the equipment."

Johnson listed ease of use as a second requirement. "One vendor took almost half an hour to set up his equipment," he recalled. "We are not interested in that type of microcomputer."

The machine must be powerful enough to run software packages such as Lotus Development Corp.'s 1-2-3. "We require at least 256K [bytes of random-access memory]," Johnson said.

Once the portables are delivered, "we will leave the agents alone and let them develop applications for six months," Johnson said. One trained technician will be in the Worcester office to connect wires, answer questions and solve problems.

Gain expected

The IRS is expecting a significant productivity gain from the portables. A similar program by the inspector general's office of the U.S. Department of Transportation in 1983 yielded a 20% to 25% productivity gain, Johnson said.

In addition to using microcomputers in the field, the Boston district is using them to advance employees' computer literacy.

Six months ago, the Boston district instituted a voluntary course in which employees receive self-study manuals and Texas Instruments, Inc.'s 994/A micros. "Rather than pay $800 for a Basic course, we spend $8 for a manual," said Robert Pontbriant, the Boston district's data service chief.

Response to the course has been overwhelming, according to Johnson. Approximately 500 employees have completed the course; each receives a certificate at an award ceremony and can receive college credit for taking the course.

To pass the course, an employee must write a program that improves IRS productivity. A number of programs are used in IRS offices throughout the country. "One of the employees wrote a 1,000-line program for calculating a special tax class," Johnson said.

"Agents had requested that program for years. With the volume of work the data processing department had, the program was never completed. Word of the program spread to other offices, which now use the program," he said.

Second-class postage paid at Framingham, Mass., and additional mailing offices. *Computerworld (ISSN-0010-4841) is published weekly, except: January (6 issues), February (6 issues), March (5 issues), April (7 issues), May (5 issues), June (7 issues), July (6 issues), August (6 issues), September (6 issues), October (7 issues), November (6 issues), December (6 issues) and a single combined issue for the last week in December and the first week in January by CW Communications/ Inc., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.*

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Computerworld can be purchased on 35 mm microform through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone (313) 761-4700. *Computerworld* is indexed: write to Circulation Dept. for subscription information.

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Indictments charge illegal DP shipments to Soviets

By Edward Warner
CW Staff

BOSTON — A 23-count indictment handed up by a federal grand jury in Boston last week charged several U.S. and foreign firms and businessmen with shipping millions of dollars of sophisticated computer equipment to the Soviet Union in violation of trade restrictions.

Only two U.S. citizens are among the 11 companies and individuals indicted. They are Albert C. Beeson Jr., vice-president and contract administrator of MLPI Business Systems, Inc. of Phoenix and R. Paul Boucher, president and owner of Young Sales and Service, Inc. of Nashua, N.H. Both firms were also indicted.

The indictment alleges that the two firms took part in a conspiracy in which computers and related equipment were shipped to the Soviet Union and East Germany via Canada and Switzerland during 1981 and 1982.

Among the equipment listed as having been shipped are seven Digital Equipment Corp. PDP-11/34 and PDP-11/44 minicomputers and a group of nine DEC PDP-11/04 and PDP-11/34 machines.

Also said to have been shipped by the indicted are four Hewlett-Packard Co. 9825T desktop computers, which the company said are primarily used in manufacturing; six Digi-Data Corp. tape transport systems; six DEC computer interfaces; a Data General Corp. CPU board; and other equipment.

MLPI denial

In a prepared statement, MLPI Business Systems called the indictment "publicity and politically motivated." The firm said that it had cooperated fully with the federal investigators and that none of its officers "was guilty of any wrongdoing, whatsoever."

The statement also claimed the firm had no financial involvement in the alleged exports and that an export agreement existed solely between DEC and MLPI-Canada, its Canadian subsidiary, which was also indicted.

The indictment claims that two men, Deiter Enderlein and Fred Schiavo, acting through two Swiss firms, Semitec AG and Elmont AG (each half-owned by Schiavo and both indicted), ordered the U.S.-made computers and equipment from two Canadian firms, MLPI-Canada and Eurodata, Inc., which was also indicted. Enderlein and Schiavo also are alleged to have arranged transportation of the equipment from West Germany and Switzerland, where it had been sent by the Canadian firms, to East Germany and the USSR.

Eurodata's president and owner, Leslie Klein, was arrested at Miami International Airport April 2, shortly after the indictment was turned over to federal prosecutors.

The computers and equipment sent to the Soviets, the indictment states, are on the Commerce Department's Commodity Control List of products that cannot be shipped to the USSR and Soviet bloc nations. Items from that list cannot be shipped outside the U.S. without a valid export license, unless the products are destined for use in Canada. They cannot be shipped out of Canada without a U.S. re-export license, which the Canadian firms are charged with failing to obtain.

The indictment also claims that several of the conspirators filed false statements claiming the equipment being exported was only for Canadian use and that Boucher filed a false Shipper's Export Declaration with the U.S. Customs Service.

Also named in the indictment are MPLI-Canada executives Ray McLellan and Olivier DuPaul. McLellan, the firm's order administration manager, and DuPaul, branch manager of one of the firm's offices, are alleged to have ordered five computer systems from DEC in 1981 that were later re-exported from Canada to Schiavo and Enderlein. They are also alleged to have misrepresented the destination of the nine PDP-11/04 and PDP-11/34 computers, knowing that the computers were destined for the Soviets.

An HP spokesman said his firm sold four HP 9825T computers to Young Sales and Service in late 1981 and early 1982 after the firm met HP's requirements to prove that it was an OEM vendor. Young was to write software for the computers, the spokesman said, but when HP learned that no software was being written by the company, it ceased doing business with Young when its contract expired in June 1982.

When Young later placed another order with HP, this time for eight 9825Ts, the order was turned down, the HP spokesman added. A spokesman for DEC, meanwhile, said his firm requires OEMs to undergo "a very intricate process" to prove their authenticity. He declined to comment further.

The case is being prosecuted in Massachusetts, where most of the equipment is said to have originated, primarily from DEC and HP. Neither of the case's two federal prosecutors could be contacted despite repeated attempts.

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NEWS

DEC high-end VAX adds 30% to 50% more power

By Tom Henkel
CW Staff

NEW YORK — In an apparent response to the tidal wave of recently announced superminicomputers from its competitors, Digital Equipment Corp. last week splashed back with a high-end addition to its VAX-11 line. The VAX-11/785 unit offers 30% to 50% more performance than the older Model 780 and carries a 15% higher price tag.

The performance of the high-end VAX-11 — unwrapped last week at the same press conference at which DEC unwrapped its own relational data base management system for the VAX line (story on page 1) — was attributed by DEC to faster Schottky CPU circuits, the quadrupling of cache memory capacity to 32K bytes and the addition of an optional floating-point accelerator.

The machine sports a 133-nsec processor cycle time, which is one-third faster than the Model 780's 200-nsec processor cycle time. The improved performance, DEC said, means the 785 can perform better than the 780 in computer-aided design and manufacturing and educational, technical and commercial time-sharing applications.

Instruction microcode

Instruction microcode for the VAX-11/785 is stored in random-access memory; in the 780, it was located in read-only memory. This change, DEC said, makes it easier to make microcode updates while also increasing CPU performance.

Furthermore, the console memory capability of the 785 is 48K bytes; the 780's maximum is 16K bytes. This increase on the 785 improves console performance for system monitoring and error reporting and also makes maintenance easier, DEC claimed.

By utilizing specialized synchronization circuitry, the VAX-11/785 can use the same Synchronous Backplane Interconnect interfaces, controllers and peripheral equipment of smaller VAX series processors. In addition, according to Bruce A. Ryan, manager of the VAX product marketing group, users of the 780 processor can field-upgrade to the 785 for $91,200. A field-upgrade kit, including the optional floating-point accelerator, costs $95,000.

Runs both VMS, Ultrix-32

Ryan also noted that the 785 can run both the VMS and Ultrix-32 operating systems (Ultrix-32 is DEC's version of Unix).

The optional floating-point accelerator, the FP785, is said to enhance by an average of 47% the processor's performance in compute-intensive applications. The floating-point processor uses the same technology and internal timing as the VAX-11/785 and costs $14,000.

With first customer shipments slated for September, a base configuration of a VAX-11/785 processor with 2M bytes of main memory, cabinetry and a VMS operating system license costs $195,000.

A preconfigured system designed to use DEC's All-In-1 office automation software costs $322,735. That configuration includes 6M bytes of main memory, a 456M-byte disk drive, magnetic tape drive, four Decmate II small business systems with word processing software, licenses for VMS, the All-In-1 office menu, VAX Decmail and the DECDX/VMS communications package (which facilitates communications with the Decmate II).

A fully configured system that operates in DEC's Vaxcluster multiprocessing environment costs $399,000. That configuration includes 8M bytes of memory, a console, VMS, 1.2G bytes of fixed disk storage, DEC Unibus cabinetry and a magnetic tape drive.

DEC is headquartered in Maynard, Mass. 01754.

DIGITAL EQUIPMENT CORP.

System Characteristics	VAX-11/730	VAX-11/750	VAX-11/780	VAX-11/785
Relative Performance[1]	20	40	62	86
Mips[2]	.36	.72	1.06	1.4
Memory Size in Bytes (Minimum-Maximum)	1M-5M	512K-8M	512K-32M	2M-32M
Purchase Price[3] (Memory Size)	$21,500 (1M)	$47,000 (1M)	$145,000 (2M)	$195,000 (2M)
Lease Price (Lease Term)	None	None	None	None
Machine Cycle Time (Nsec)	810	320	200	133
Channels (Minimum-Maximum)	1	1-5	1-8	1-8
Cache (Buffer) Size	None	4K	8K	32K
Bus Architecture	Yes	Yes	Yes	Yes
Price per 1M Byte Of Main Memory	$4,900	$4,900	$4,500[4]	$4,500[4]

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. Vendor claims.
3. For a basic configuration consisting of 2M bytes of main memory, power supply, cabinetry and a VMS operating system license.
4. Memory upgrades are available in a minimum 2M-byte configuration for $9,000.

CW Chart

Newest VAX garners more punches than praise

By Tom Henkel
CW Staff

Digital Equipment Corp. last week received more jabs than praise for its newly announced VAX-11/785 superminicomputer.

Comments at DEC's product announcement last week in New York and on the floor of Dexpo East 84, a conference for DEC users in Boston, ranged from "too little, too late" to "a nonannouncement."

The new processor was a letdown for many who expected DEC to unveil the long-awaited Venus, a high-end successor to the VAX-11/780, which DEC still promises to announce sometime this year. Instead, DEC appeared satisifed to share the dimmer corner of the the limelight with AT&T's line of VAX-class processors, announced two weeks ago [CW, April 2], and IBM's new low-end System/36, announced last week (story on page 8).

Despite any disappointment it may have engendered, the announcement of the VAX-11/785 did give capacity-starved users of the VAX-11/780 an upgrade option. DEC claims the 785 offers 30% to 50% more performance than the 780. Previously, to get that kind of performance enhancement, DEC users basically had to switch to another vendor's system, such as IBM's 4300 line.

And many VAX users have been switching to the 4300 over the past few months, according to Sonny Monosson, president of American Computer Group, Inc., a Boston firm that deals in used DEC hardware. Monosson said he knows DEC is losing high-end VAX users to IBM because that is how he makes a living — buying up used VAX processors. Monosson claims the market for used VAXs has been brisk.

But other industry watchers contend that the VAX line is selling well. In fact, one analyst said DEC is beating IBM in the mid-range processor market.

If DEC is indeed satisfied with sales of the 780, why would it jeopardize that market by offering a new processor that will not be available until at least September? According to Stephen A. Levine, the president of TEC Computer Systems, Inc., a Newton, Mass., DEC distributor, DEC had to announce the 785 to appease its current installed base of 780 users.

But is the 785 really a good deal for existing users? In material presented to the press and industry analysts at New York's Windows on the World restaurant last week, DEC stated that the 785 costs about 15% more than the 780. That 15% appears to apply only to fully configured systems. The purchase price for a base configuration is $195,000, about 35% greater than the $145,000 purchase price for a similarly configured 780, noted Dave Moschella, an industry watcher with International Data Corp. in Framingham, Mass.

For current users of VAX-11/780s, there is a charge of better than $90,000 to field-upgrade to the 785. While that is certainly less costly, not to mention less disruptive, than migrating to IBM's 4300 line, Moschella noted it still appears to represent the same price curve that has always been offered on the VAX line.

Not anxious for early orders?

DEC does appear anxious to chalk up early orders for the VAX-11/785. The spokesman admitted DEC is offering a discount on 780-to-785 upgrade kits to users willing to purchase 780 processors by the end of June. The spokesman said he was not sure how much a discount is being offered, but industry sources say the upgrade kit is being discounted about $40,000.

In remarks at the New York announcement, however, DEC President Kenneth Olsen stated, "We're not going to give the company away by lowering our prices too quickly." That remark prompted some industry watchers to speculate that DEC announced the 785 purely to get more mileage out of the current VAX lineup before the Venus announcement. But other analysts, like IDC's Moschella, think Venus may offer so much more performance than the 780 that some users will not be able to justify buying it.

In any case, the VAX-11/785 will not be available until at least September, and, a DEC spokesman said, the 780-to-785 upgrade kits will not be available for an indefinite time after that. That has industry watchers puzzled. If DEC is set to announce the high-end Venus by the end of the year, they ask, why announce a slightly more powerful version of the 780 that probably will not be available for volume shipments until about the same time as the Venus announcement?

Videotex software fits VAX-11

NEW YORK — Digital Equipment Corp. last week unwrapped videotex software for the VAX-11 series of superminicomputers running under its VMS operating system.

Dubbed VAX VTX, the package reportedly can be incorporated with DEC's All-In-1 office menu system and supports the company's VT100 and VT200 CRT terminals, VT100-compatible terminals and the entire line of DEC microcomputers.

VAX VTX is comprised of three components, a spokesman said, including terminal control/concentrator software and data base access and update software.

The spokesman said VAX VTX is also compatible with DEC's Decnet communications software. It can be used as part of the All-In-1 office information system and can be called from the All-In-1 menu.

VAX VTX is expected to be available in June and will license for $25,000, according to the spokesman. DEC is headquartered in Maynard, Mass. 01754.

RDB gets mixed greeting

John Gallant
and Paul Gillin
CW Staff

Digital Equipment Corp.'s first foray into the relational data base management system (DBMS) arena signals a renewed emphasis on software in general and the information center in particular. However, broad market acceptance of the new products is less than certain.

That was the reaction of industry watchers contacted by *Computerworld* following DEC's introduction last week of the VAX RDB/VMS and VAX RDB/ELN software for the VAX-11 series processors.

The announcement signals DEC's commitment to the information center, according to Shaku Atre, president of Atre International Consultants in Rye, N.Y. "DEC now has a large VAX, Unix, a local-area network and personal computers," Atre said. "But it has needed something to sit on the VAX that is easy to retrieve from. DEC is trying to make it attractive to buy a complete system."

But Atre also noted that DEC "has not shown a great deal of enthusiasm about its software products" in the past. "DEC may have to convince people that it is serious about this."

Missing details

Skepticism centered on DEC's failure to provide many technical details about the RDB software. "A lot remains to be seen," said Dr. George Schussel, president of Digital Consulting Associates, Inc. in Wakefield, Mass. "If this software is more complex and comprehensive than other systems on the market, then it will be embraced by DP managers. If not, it may be more of an information center tool."

"The announcement touched briefly on some of the system's capabilities, but there was no real discussion of the user interfaces," said Gary Morgenthaler, president of Relational Technology, Inc., which markets the Ingres relational DBMS. "It's not clear what additional software users will need to make the system functional."

According to Dan Nolan, president of Heuristic Developments, Inc., DEC users will adopt a "wait-and-see" attitude toward the new products. "DEC will push these products heavily, but I think most customers will sit back and watch," he said. "People are reluctant to accept new disciplines."

Announced as supporting distributed data bases, the DBMS could be a piece in DEC's plans to give its mainframe users a place to migrate, according to Ann Morley, senior software consultant at International Data Corp. in Framingham, Mass. "They have to convince Decsystem-10 and 20 users to migrate to VAX clusters rather than to the IBM 30 series," she said.

However, Ronald G. Ross, editor of the "Data Base Newsletter," doubted that distributed data bases are feasible yet. "Every vendor making relational noise is claiming to support distributed data processing," Ross said, "but I'm not sure they'll follow up on that with a truly distributed data base. I'm not convinced either that a lot of people are willing to go the distributed data base route."

Industry analysts also split on the impact of DEC's announcement on established relational DBMS contenders, such as Oracle Corp.'s Oracle, Relational Technology's Ingres and Cincom Systems, Inc.'s Ultra. "It's clear that many current DEC user companies will prefer DEC's own system over others, and that will hurt," Schussel said.

"I hope the others will tighten up their acts as a result of this," Nolan said.

"But I'm afraid they'll attack DEC at the print-shop level. They will minimize whatever capabilities the DEC systems have, but they should be moving toward more R&D," Nolan added.

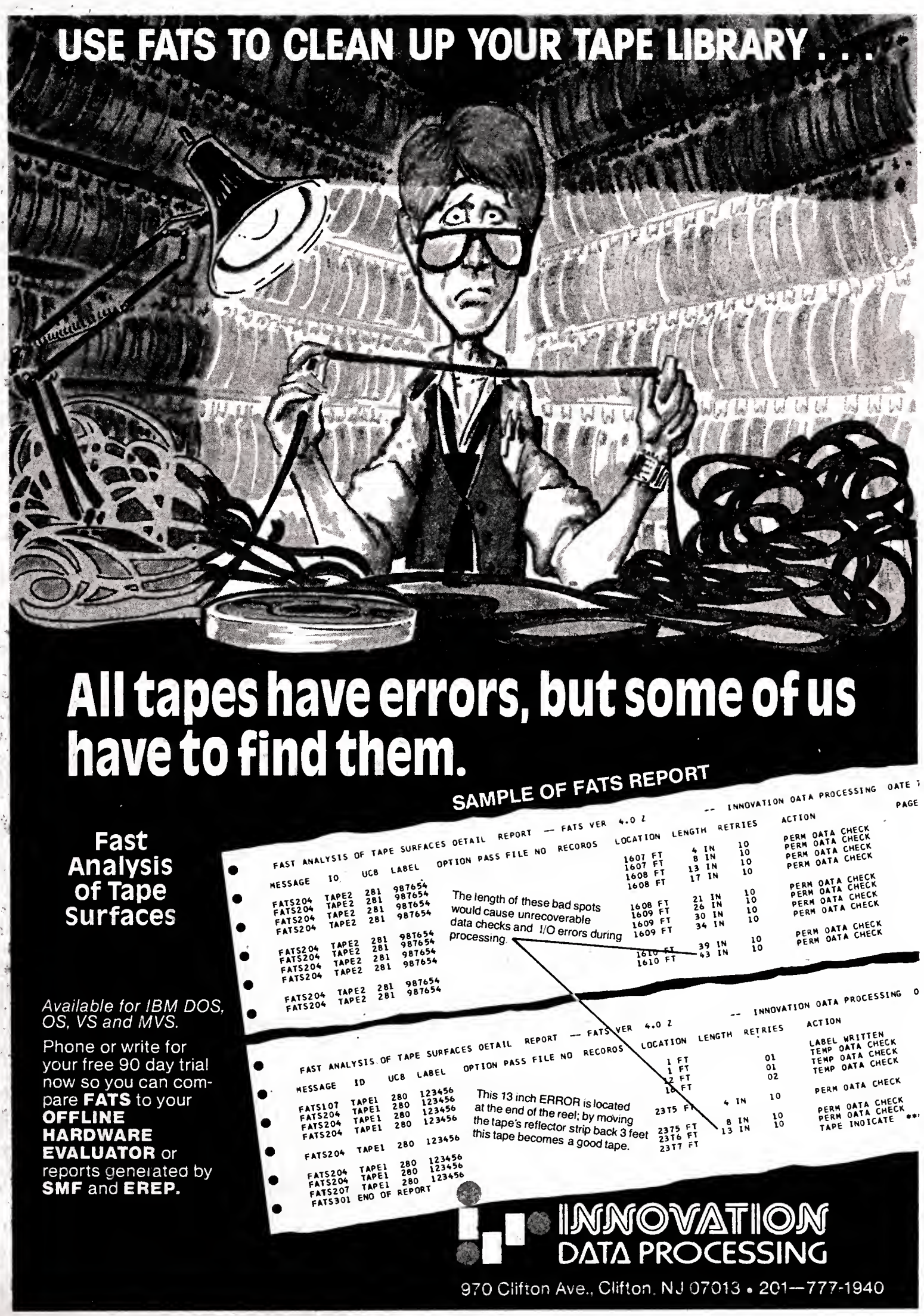
DEC from page 1

The two DBMS use the Digital Standard Relational Interface as a common application interface, allowing application programs written for either system to access data managed by the other, the spokeswoman noted. They also enable users to retrieve and update information transparently from remote systems using Decnet communications links. With the Decnet facilities, application programs can run on one system, while data can reside on any other VAX system in the network.

Both VAX RDB/VMS and VAX RDB/ELN are said to offer an interactive query language to aid data manipulation and debugging of application program logic. The packages also feature a data definition language for definition and central storage of data descriptions, data validation functions to ensure conformity to predefined parameters, transaction recovery features and contention arbitration to handle simultaneous attempts to access the same data.

In addition, VAX RDB/VMS reportedly adds security features to those provided by the VMS operating system, and it provides what the spokeswoman described as long-term journaling to preserve data integrity in the event of application or system malfunction.

Development license fees are $9,000 for VAX RDB/VMS and $7,500 for VAX RDB/ELN. VAX RDB/ELN will be available in June, VAX RDB/VMS in August from DEC, headquartered in Maynard, Mass. 01754.



IBM issues products to tie its micros, larger systems

By Eric Bender
CW Staff

NEW YORK — IBM last week issued a barrage of new products, most aimed at linking its Personal Computers with larger IBM machines.

The introductions "just about turn the [Personal Computer] into a new system," claimed Philip Estridge, president of IBM's Entry Systems Division. "They take the [Personal Computer] into the mainstream of IBM's office strategy."

Among the new offerings unveiled at a press conference here:

■ The Professional Office System/Personal Computer Connection (Profs/PC²). Profs/PC² extends selected Profs functions to the IBM Personal Computer, Personal Computer XT, 3270 Personal Computer, Personal Computer XT/370 and Portable Personal Computer. It allows users to transfer Profs incoming mail and other business information to Personal Computers for stand-alone processing; the results can be sent from the micros back to Profs for processing or distribution to other Profs users, IBM said. Available in June, the program will cost $200.

■ Transfer facility programs that connect the System/36 or the System/38 with the Personal Computer, Personal Computer XT or Portable Personal Computer. The programs allow the micros to both download and upload files to and from the larger machines, said H. Mitchell Watson Jr., president of IBM's System Products division.

Two transfer facilities will be available next month, one for the System/36 and the other for the System/38. Each costs $950.

■ The Displaywrite series of text processing software programs for the Personal Computer, Personal Computer XT, Portable Personal Computer and 3270-PC. Similar to the Textpack 4 program, which runs on the IBM Displaywriter, Displaywrite 2 includes a spelling checker with about 100,000 words; it costs $299. Displaycomm BSC is a Binary Synchronous Communications program enabling Personal Computers, Personal Computer XTs and Portable Personal Computers to send Displaywrite 2 documents to other suitably equipped Personal Computers, Displaywriters and host computers; it carries a $375 price tag. Both programs are available this month.

■ IBM 8100 information system support for the Displaywrite 2 program running on a Personal Computer or Personal Computer XT. Attached to an 8100 local or remote loop and operating under Displaywrite 2, Personal Computer workstations can exchange documents with the larger system, according to the company. The support is available under the 8100 DPCX/DOSF Release 4 and DPPX/SP Release 2.

■ An attachment kit that connects the Displaywriter and the Personal Computer, Portable Personal Computer, Personal Computer XT or PCjr. The attachment allows transfer of documents and files between a Displaywriter and a single Personal Computer. The setup also permits a Displaywriter to connect with the IBM Personal Computer Cluster, using a Personal Computer as an interface. The kit is expected to be offered in August at a cost of $495.

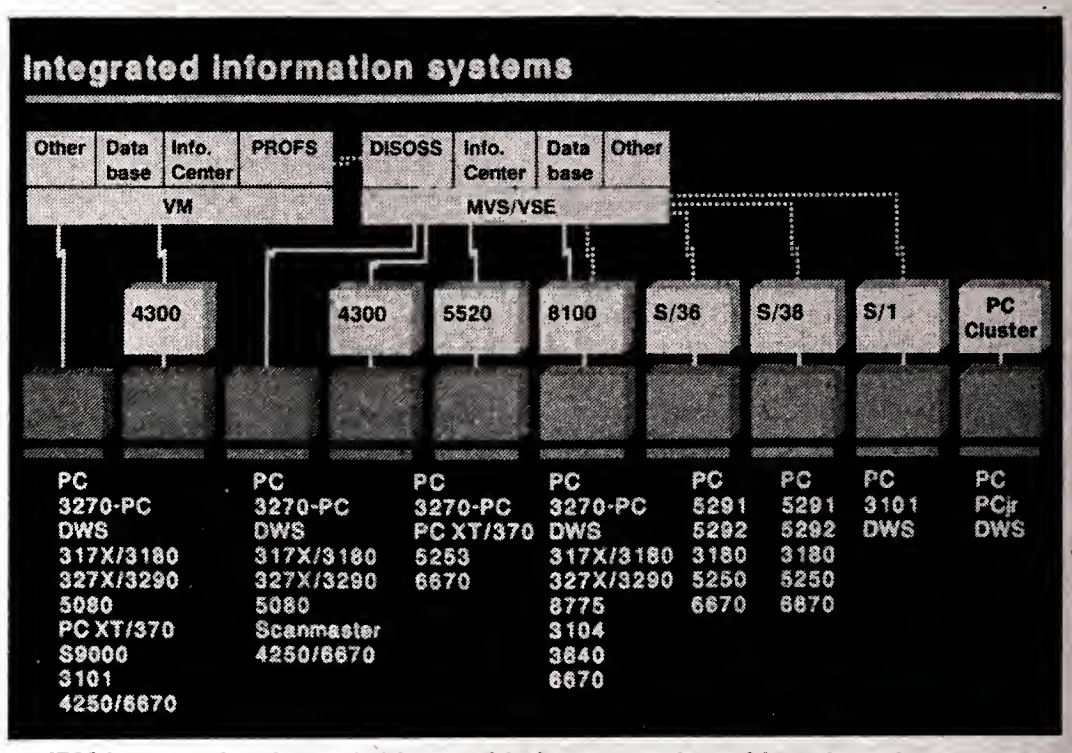
■ IBM 5218 letter-quality printer support for up to four Personal Computers or Personal Computer XTs. A printer attachment package (with cable and printer-driver program) will cost $220; the printer-sharing device will cost $625. Both will be available next month.

■ An enhanced version of the 5520/Personal Computer Attachment Program, which provides support for the Personal Computer, Personal Computer XT, 3270-PC, XT/370 and Portable Personal Computer. The Version 3 program will cost $384, and an attachment kit (with program, adapter and cable) will cost $1,113. The program is expected to be available in the third quarter.

■ The PC/Videotex program, which permits a Personal Computer, Personal Computer XT or PCjr to be used as a videotex terminal. Cost for Personal Computer and Personal Computer XT versions is $250. It is scheduled to be sold in October.

■ The PCwriter, a text processing program supported by the Personal Computer, Personal Computer XT and Portable Personal Computer. PCwriter is scheduled to be offered this month at a cost of $199.

IBM's Information Systems Group is based at 900 King St., Rye Brook, N.Y. 10573.



IBM last week released this graphic interpretation of how its microcomputers, workstations and peripherals can be integrated into larger system configurations. The graph highlights both the diversity of connections and the ubiquity of the IBM Personal Computer.

The dotted lines show document-transfer capabilities that IBM intends to establish, but has not yet released as products.

"DWS" indicates IBM's Displaywriter word processing system; "PC" stands for the Personal Computer; the 6670 is IBM's information distribution system; and the S9000 is a laboratory-oriented microcomputer.

The 5253, 3101, 3104, 3170 series, 3180, 3270 series, 3640, 3080 and 8775 are display stations; the 4250 is a printer; the 3290 is a plasma-panel display station; the Scanmaster is an image processor; the 5291 and 5292 are color display stations; and the 5080 is a raster display terminal.

Latest System/36 handles 86 terminals, fits under desk

NEW YORK — IBM last week introduced a low-end model of its System/36 small business system that handles up to 86 terminals and fits under a desk.

The new System/36 Model 5362 provides "the same system throughput as a full System/36" at a 38% lower entry price, said H. Mitchell Watson Jr., president of IBM's System Products Division, at a press conference held here last week to announce the system. The system is for both new and experienced customers who do not need all the storage capacity or devices available with a standard System/36 Model 5360.

The Model 5362 runs all System/36 programs without recompiling and uses most System/36 printers and displays, according to IBM. It plugs into a standard grounded 110V wall socket and handles up to 22 local workstations and 64 remote units.

The system, scheduled to begin shipping next month, comes with 128K bytes of random-access memory (RAM), expandable to 512K bytes; up to 120M bytes of disk storage; and a 1.2M-byte diskette drive. It can accept up to four communications lines and operate in networks using Systems Network Architecture/Synchronous Data Link Control, Binary Synchronous Communications or X.25 packet-switched protocols.

The biggest difference between the 5360 and the 5362 is the amount of storage available, IBM said. The top-of-the-line version of the 5360 features 1M byte of RAM and 800M bytes of disk storage. The top-of-the-line 5362 offers 512K bytes of RAM and 120M bytes of storage.

Four models of the 5362 are available: the A01, with 30M bytes of disk storage and a starting price of $13,000; the A02, with 60M bytes of storage and an $18,000 price tag; the A03, with 90M bytes of storage for $24,000; and the A04, with 120M bytes of storage and a $28,000 price.

A basic configuration, with 128K bytes of RAM , 30M bytes of disk storage, display terminal, printer and System/36 System Support Program operating system, will cost $23,510.

Maintenance charges for the new system are substantially less than for the 5360, IBM said. The monthly fee for the starting 5362 unit is $60; the starting 5360 costs $96 a month.

IBM Credit Corp. will offer term lease and installment payment financing, with term leases starting at $253 a month for a five-year lease of the lowest priced 5362.

In conjunction with last week's announcement of the System/36 Model 5362, IBM also lowered one-time charges for selected features available in the System/36 System Support Program.

More information is available from IBM's Information Systems Group, 900 King St., Rye Brook, N.Y. 10573.

IBM from page 1

Reiterating that sentiment, George Colony, president of Forrester Research, Inc. in Cambridge, Mass., said that he believes the most significant part of the announcement is the new capability to exchange files and documents between Personal Computers and other systems.

"The real trick for IBM," Colony explained, "is to keep the [Personal Computer] as an 'open' machine for third-party software developers and pull it under data processing to link it to higher level systems. I think it is doing this successfully."

Additionally, Colony believes the announcements give the 5520 a "new lease on life." While the days of the 5520 as a shared-logic word processing system may be limited, Colony sees the 5520 being adopted as a Personal Computer controller.

If that does not keep the 5520 from going under, it might eventually fall prey to the Personal Computer, a fate that, according to Drexel's Casey, also awaits the Displaywriter now that Displaywriter software is available for the IBM micro.

Turning to the "Baby 36," IBM's newly announced low-end System/36, analysts were universally impressed by the unit's low price and compatibility with applications software developed for other processors in that product family.

Skip Bushee, executive vice-president of Infocorp, a research organization in Cupertino, Calif., said the major advantage of the new system is its $24,000 price tag and its compatibility with System/32, System/34 and high-end System/36 applications. "You used to have to spend $50,000 for a system that could play all those applications," Bushee noted.

Shareholder wins proxy fight, vows to oust MAI chief

By David Myers
CW New York Bureau

NEW YORK — Insurgent stockholder Asher B. Edelman has won his bitter proxy fight with Management Assistance, Inc. (MAI), nailing down four seats on MAI's 10-member board of directors and vowing to oust Raymond P. Kurshan, chairman and president of the minicomputer maker and computer services firm.

By a vote of 3.9 million shares to 1.9 million, Edelman's slate of directors — Raymond French, Clark Mandigo, Charles P. Stevenson and himself — was elected at the MAI annual meeting on March 14, it was disclosed last week. Edelman, whose combine now holds 12.8% of MAI's stock, told *Computerworld* last week that the group's goals are to sell the $376 million company and force Kurshan out of office.

"We want to do everything possible to make this company work for its shareholders. Neither [Kurshan] nor his work fits that description. Raymond Kurshan is a total autocrat and without talent," Edelman said.

Not confident of ouster

However, Edelman said he is not confident of being able to oust Kurshan. "Confidence implies hubris, and that is not my motive," Edelman said.

Reached at MAI offices here, Kurshan said he has no intention of stepping down. The 13-year company president and his management team captured "a fair share of the independent shareholder vote" once the Edelman group's votes were subtracted, according to Kurshan.

"I don't know how that could have happened," Edelman said, pointing out that his group holds slightly more than 900,000 shares. "If you take those out, the vote was 3:2 instead of 4:2."

Nevertheless, Kurshan insisted he did not consider the lost proxy battle "a personal repudiation of my efforts."

Kurshan's management team had waged a fierce and at times mudslinging campaign against Edelman, raising questions about Edelman's experience in the computer industry and detailing his legal brushes with the Securities and Exchange Commission.

By contrast, Edelman's campaign was low-key. In proxy materials, he asked shareholders' votes to bring about "a change in management's direction" and "emphasize [MAI's] maintenance and service business," perhaps even dropping manufacture of the Basic Four line of minicomputers. Edelman also criticized management salaries.

Edelman, French, Mandigo and Stevenson will be invited to serve on MAI committees "so they can form better judgments about the company," Kurshan said. "They have lacked an understanding of this company. Their comments and criticisms have been inappropriate."

Talking with prospective buyers

Both Kurshan and Edelman said they are in discussion with several prospective buyers or merger partners.

Edelman said he is talking with computer industry firms and added that MAI could either be sold "lock, stock and barrel" or be divided into manufacturing and service halves to be sold to two separate buyers.

Kurshan insisted he had concluded "several months before Mr. Edelman came upon the scene" that MAI needed to find a 'suitable merger partner' in order to halt two straight years of losses. MAI lost $3.4 million in 1983. However, Kurshan said his discussions with likely purchasers have not gone beyond the stage of exchanging information. "We are not negotiating with anyone," he said.

The proxy election will wind up costing MAI over $5 million, Kurshan said, resulting in an anticipated loss for the company's second quarter ended March 31, according to Kurshan. Without the proxy battle expenses, second-quarter income would have surpassed last year's, he added.

Court upholds tariff delay

WASHINGTON, D.C. — Bell Atlantic's effort to force early implementation of new, higher tariffs has been shot down, at least for now.

Bell Atlantic, one of the seven regional Bell operating companies created when the Bell system was broken up Jan. 1, asked U.S. District Court Judge Harold Greene on March 26 to bar the Federal Communications Commission from delaying the tariffs any longer. They had been scheduled to become effective April 3, a date about to be changed to June 13 [CW, April 2]. Bell Atlantic also requested an immediate court hearing.

Greene denied the latter request and put off a final decision until he has reviewed comments from interested parties. As a result, final action will be delayed several days. Meanwhile, the new tariffs have been deferred until June 13.

Do you have some questions about VSAM file handling in COBOL?
Then here's the book for you...

VSAM for the COBOL Programmer

If you have to work with VSAM files and you're unsure of what you need to know about them, then you should get a copy of *VSAM for the COBOL Programmer*. Just as its title implies, this practical, how-to guide will teach you all the basics of handling VSAM files in COBOL.

The first chapter is an introduction to VSAM. It talks about VSAM's advantages ...and drawbacks...and introduces you to the common terms you'll need to know before you can continue.

Chapters 2 and 3 are the meat of the book because they cover VSAM key-sequenced files. Key-sequenced files are equivalent to ISAM files on a non-VSAM system, and they make up about 95% of all VSAM files.

Chapter 2, then, explains the COBOL elements you need to know for key-sequenced files. And it gives in-depth coverage to handling the errors that can occur when an I/O statement is executed for a VSAM file. In addition, it tells you how to code the OS JCL you need for COBOL programs that use VSAM files ...and why the JCL is so much simpler than it is for ISAM files.

Chapter 3 covers IDCAMS, the Access-Methods-Services program. This is the utility program you must use to set up disk space for a VSAM file before you can even create the file in a COBOL program. In addition to learning how to set up file space, you'll learn how to use IDCAMS to: copy, print, and rename VSAM files; load a VSAM file from a non-VSAM file; and list and maintain a VSAM catalog.

Once you've mastered the material in chapters 2 and 3, you can quickly go through chapters 4 and 5. They cover the COBOL, JCL, and IDCAMS considerations for entry-sequenced and relative-record VSAM files. These are equivalent to sequential and relative files on non-VSAM systems.

Throughout chapters 2-5, the learning is geared toward the OS user. But chapter 6 is devoted to the DOS user. It presents all the variations you need to know about if you're working on a DOS system. So here, you'll learn how the COBOL code, the JCL, and the IDCAMS statements differ from OS. And I think you'll be surprised at how few differences there are.

In short, then, by the end of the book you'll have a thorough grasp of what you need to know to write COBOL programs for VSAM files.

2 reasons why this book is effective

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(By the way, this book does *not* cover dynamic access or alternate indexing. Alternate indexing will be covered in *CICS for the COBOL Programmer: Part 2*, due out at the end of the year.)

2. Perhaps the most important feature of this book is that it contains plenty of examples, so you always see just what the author is talking about. Examples like:

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Benefits of micros come slowly, managers warned

Fortune 1,000 conference-goers urged to practice skills at home

By Paul Korzeniowski
CW Staff

DALLAS — Senior managers' hopes of quickly reaping the benefits of microcomputers have to be tempered, Thomas Samson, partner at Arthur Young and Co., warned here last week at the Fortune 1,000 Personal Computer Market Forum sponsored by Future Computing, Inc.

"Time is the most precious item that a senior manager has," according to Samson, whose firm trains senior managers in the use of personal computers. "He wants instant gratification when he sits down and uses a microcomputer."

But he doesn't receive it. Samson estimates that it takes at least 20 hours before a senior manager becomes proficient working with a software program.

"It's like flying," Samson noted. "A pilot takes 20 hours of ground instruction before he steps into the cockpit. It takes 60 to 100 hours before one becomes really productive with a software package."

This period can be shortened if the manager brings the microcomputer home. "The best time for users to learn is at home for a few hours at night or during the weekend," Samson said. "I urge companies to invest in portables and encourage employees to take them home." Senior managers are turning to microcomputers to facilitate the analysis of corporate data. Before the advent of personal computers, these managers were frustrated at the data processing department's attempts to build corporate information pipelines, according to Samson, who said that "few of these pipelines were successful."

'I urge companies to invest in portables and encourage employees to take them home.' — Thomas Samson, partner at Arthur Young and Co.

Managers look to microcomputers as the new messiahs for providing these information pipelines. "Vendors and data processing managers claimed that hooking mainframes and microcomputers for data analysis is an easy process," Samson stated.

However, senior managers become frustrated at the steps needed to find and load useful data. "Data is stored in a manner a technician can understand, but the manager cannot easily use," Samson said. "There are only a handful of ways that data can be manipulated. It takes time to complete the process — time that senior managers do not have."

Samson is not impressed with manufacturers' recent claims of products designed for ease of use. "[Apple Computer, Inc.'s] Macintosh will help first-time users become acquainted with the machine," Samson explained. "But time is spent mastering the functionality of a specific program. The Macintosh will not solve that problem."

Micro-mainframe links not yet seen satisfying users

By Paul Korzeniowski
CW Staff

DALLAS — Companies supplying microcomputer-to-mainframe communication links are responsible for providing the security features needed to ensure data integrity.

So claimed James Black, director of advanced concepts at University Computing Corp., who spoke here last week at the Fortune 1,000 Personal Computer Market Forum sponsored by Future Computing, Inc.

Current links do not limit access of data to authorized personnel or ensure that data updated on a microcomputer is transferred back to the mainframe, according to Black.

Inadequate security features were one of many micro-to-mainframe link shortcomings that analysts here noted. "Companies are announcing but not delivering products," Black stated. "We have hardware [and] software, and now we have vaporware that disappears when you try to find it."

In addition, manufacturers are announcing links with very limited capability, according to Don New, president of Phaze Information Machines Corp. "Most of the current links access only the vendor's mainframe package," New said. "The product is designed to protect the company's market share and not to help the end user."

Besides limited capabilities, the links are difficult to manipulate, one user claimed. "Vendors claim that hooking microcomputers to mainframes is easy," said Thomas Samson, partner at Arthur Young and Co. He claimed that data as currently stored is understood by the technician, but is not easily used by the manager.

One vendor advocated the emergence of easy-to-use links. "The link should be mundane and work as easily as a telephone," said David Clark, director of consulting at Execucom Systems Corp.

But providing an easy-to-use link is not all that is required. "The problem is not user-friendliness but user-effectiveness," Black said. "The product can be very friendly, but if it doesn't help productivity, it will not be used."

Productivity can be increased if the link works with any microcomputer or mainframe program. "One link should provide a gateway to all data," Black said. "It shouldn't matter if users work with Lotus [Development Corp.'s] 1-2-3 or any other program."

Differing data formats hinder the development of that type of link. "There just aren't any standards for data formats," New said.

Since mainframes and micros grew in different eras, format differences are significant. "Mainframe applications were designed more than a decade ago," New said. "We have to retrofit mainframe data so that the microcomputer can use it."

Retrofitting these applications will take time. "We should attack the problem by building on what is already there," Clark said. "We should design simple links, be satisfied with quick, small wins and use that experience to build more complete links."

AT&T to request waiver for subdivision

WASHINGTON, D.C. — AT&T plans to ask the Federal Communications Commission soon for a waiver of the Second Computer Inquiry decision that would allow a newly created subdivision to market transmission service and terminal equiment on a bundled basis to the federal government, a spokeswoman said last week.

The new entity, set up within AT&T Technologies, Inc., would install and maintain whatever it sold.

The idea was vigorously opposed by the company's competitors, who insist that if the waiver is granted, it will enable AT&T to underprice other bidders by offering the transmission services at below-cost rates. That would force users of AT&T's regulated services to make up the difference, explained John Morgan, general manager of government systems for the Bell Atlantic telephone companies.

A major reason for adopting Computer Decision II, he added, was to prevent such cross-subsidies.

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Turn micros into marketing tools, bankers urged

Premium placed on the delivery of customer services

CW AT EFTA

By James Connolly
CW Staff

ORLANDO, Fla. — Personal computers are tools that bankers can use not only in back rooms for accounting purposes, but in the lobbies to provide direct services to customers, the Electronic Funds Transfer Association Convention (Efta) was told here last week.

"What the customer wants is a responsive bank. The front-line staff can't just be order takers," said Wayne Nystrom, president of Infoware Corp. of Nashville. "Customers want answers. McDonalds [Corp.] has a higher level of customer service on a national basis than do banks."

Nystrom and consultant Wayne Johnson, director of the accounting firm of Deloitte, Haskins & Sells of Atlanta, said that personal computers mean increased productivity and profitability for banks, organizations that traditionally have been slow to accept new technologies.

Three-quarters of U.S. banks are now using microcomputers in addition to mainframes, minicomputers or service bureaus for their data processing needs, Nystrom said. The micro can be a fun training aid, as well as a "valuable starting point for the delivery of services," he added.

Applications cited

Among the applications that Nystrom cited were customized individual retirement account projections, financial planning for upscale customers and cash management for businesses.

He singled out banks in Milwaukee and Louisville, Ky., where bankers have thrown out service manuals in favor of personal computers that show customers what they offer and that help officers steer customers away from passbooks.

"They are small uses, perhaps, but they are very important signals to what the future holds for microcomputers," Nystrom said. He expects further uses for personal computers to include more home banking, including transfer of securities.

Telling attendees that they would find their own applications as they began using computers, Nystrom advised, "You've got to get your hands on a personal computer and play with it."

He recommended starting with pilot installations.

The advantages to personal computers include immediate implementation, high rewards for a low-risk investment and a broad range of uses and benefits, he said.

Johnson said the use of computers as marketing tools should include computer-based learning for employees, electronic consulting such as funds management and expert systems and artificial intelligence as decision-making aids.

Software now at beta test sites can help microcomputers operate as expert systems in tasks such as credit evaluation and employee evaluation, Johnson said.

At the artificial intelligence level, computers feature robotics as automatic teller machines, can replace loan officers in reviewing credit applications, can provide funds settlement and can provide delinquency follow-up.

But, he warned the bankers, "You've got to be on your guard that you don't spend so much time looking at the keyboard that you lose contact with the task at hand.

"Some people get so hung up on the computer that they lose the ability to operate independently."



Nystrom

CW photo by J. Connolly

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NEWS

Limits must be set on access to EFT, attendees told

CW AT EFTA

By James Connolly
CW Staff

ORLANDO, Fla. — The computer does not know right from wrong, so limits must be set on who uses computerized funds transfers and how they use them, warned speakers at the Electronic Funds Transfer Association Convention (Efta) here last week.

The keys to funds transfer security are identification, ensuring that the proper person is accessing the network; and transaction limits, keeping potential losses to a minimum if there is a successful fraud, warned bank security consultant George H. Warfel Sr. of Warfel Associates of Menlo Park, Calif.

Sharing the podium with Warfel was Howard G. Johnson Sr., partner at Price Waterhouse & Co. of New York, who added that senior bank officials seldom understand or want to understand "hackers." He said bank managers erroneously picture hackers as home computer users equally interested in stealing CATV signals and accessing bank computers.

Johnson cited a survey of bank and retail officials, who listed security as the No. 9 concern when building point-of-sale networks. They ranked marketing and consumer acceptance first and second.

Johnson and Warfel noted that software can prevent many of the security problems associated with funds transfers and that physical security controls are relatively easy to conceptualize and execute. Noting the changes in the banking industry in recent years, as banks moved away from being 10 a.m.-to-3 p.m. businesses with transactions controlled by customers' signatures, Warfel emphasized that the use of personal identification numbers and passwords have left bank computers ignorant of who is using the system.

Technological developments and deregulation have extended the "window" in which a bank once operated, which means the bank often may be transferring more money than it has in assets, Warfel said.

Risk involvement

He said that not all EFT activity involves significant risk. Risk is determined by a combination of dollar amount, frequency of occurrence, randomness in time and dollar value and the question of whether funds are being issued to a person.

Using those factors, he concluded that telephone bill paying is a low-risk transaction in that it usually occurs at the same time each month and that the amounts involved are usually predictable.

Other low-risk transactions include preauthorized payments and automated teller machines and direct deposits, he said. At the other end of the scale are wire transfers and foreign exchanges, which are highly risky. Warfel said those transactions are random in time and value, involve large sums of money and seldom involve personal contact.

To combat fraud in the high-risk transactions, Warfel urged that banks and networks adhere to caps in their transfers, not allowing transfers after a fixed percentage of assets has been paid out until replacement funds are received. He also recommended that networks use uniform procedures to identify recipients of wired funds and criticized government regulators who, he said, do not understand the banking business and the technologies it uses.

Control over retail EFT nets seen slipping away from U.S. banks

By James Connolly
CW Staff

ORLANDO, Fla. — Retailers have the chance to steal control from banks over such consumer-oriented electronic funds services as point-of-sale (POS) terminals and bill paying, according to the president of Electronic Banking, Inc. of Atlanta.

Speaking at the Electronic Funds Transfer Association Convention here last week, Allen H. Lipis said that gasoline retailers and supermarkets will want their own — not bank-owned — POS terminals and that major nonbanking corporations are likely to control electronic funds transfer (EFT) networks as consumer-oriented services mature.

"EFT services won't mature until the late 1980s, if not the 1990s, and banking won't be the dominant force," he said. Lipis noted that only 4% of the more than 500 conventioneers were senior bank managers. "Why doesn't EFT have the attention of senior bank management? Maybe

See CONTROL page 13

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Test new technology to cure AT&T breakup ills, users told

CW AT EFTA

By James Connolly
CW Staff

ORLANDO, Fla. — The AT&T divestiture means skyrocketing rates and poorer service for the operators of bank and retail electronic funds transfer networks. These users can best cope with divestiture by experimenting with new technologies, taking active roles in telephone rate-setting proceedings and getting the most out of their own systems.

So said telecommunications consultant Alfred Natali of East Hanover, N.J., who spoke at last week's Electronic Funds Transfer Association Convention (Efta) here.

Natali told the network managers attending the conference that telephone costs will continue to rise as users deal with both AT&T and the seven divested Bell operating companies.

He noted that some rates have already more than tripled while other new charges, such as a $35 per month charge for carrying data rather than voice communications, have been added.

EFT networks dealing with AT&T and the divested operating companies may encounter extensive service delays, Natali added. Those delays may include waits of up to 100 days for installation of a private line, a key to the operation of a funds transfer network.

While the consultant offered suggestions for coping with divestiture, he warned that even those steps don't assure lower telephone bills. "Experiment with new technologies," he said, acknowledging that those technologies are capital-intensive.

Even with new technologies or with the use of alternative carriers, such as MCI Communications Corp. and GTE Sprint, the networks still must pay for private lines at the network terminals.

Those private lines, according to Natali, have been targeted for rate increases while residential service and private branch exchanges have benefitted.

Another strike against new technologies is the lack of uniformity.

"You don't know in advance where the points are going to fall when designing a network, so you have to use a uniform medium. And — guess what — the only ones who have that are the telephone companies," Natali said.

Convention attendees commented that they, too, have noticed difficulties since the January divestiture. "The basic change we have seen is in the service. It has gone downhill," said Richard J. Troidl, administrative vice-president for computer services at Empire of America in Tonawanda, N.Y.

CONTROL from page 12

they have found that the profitability is not what they hoped," he observed.

Lipis predicted that private business also will take control of the automated clearinghouses traditionally dominated by the Federal Reserve Bank and that a key to operating such ventures will be the ability to settle accounts on a same-day basis.

Lipis noted that the growth of EFT services has usually involved a 15-year maturing process.

He cited the slow growth of telephone bill paying which, according to Lipis, is still five years from maturity, and the growth of automated teller machines (ATM), which reportedly have put only a 3% dent in check writing.

The nationwide, shared ATM networks that banks operate offer little long-term success, he contended, because they are expensive to operate and are difficult for the handful of potential customers to find while traveling.

The greater profit is to be found in automated bill paying, he maintained, adding that consumers write the majority of checks for that purpose.

At present, electronic bill paying's "only real market" is the microcomputer hobbyist, he said. He noted that the future for consumer-oriented electronic bill paying lies in a complex switching system, in which bill-paying home terminals are linked to creditors' systems.

However, one area in which banks may find a market is in networking corporate bill paying, where companies such as Sears, Roebuck & Co. are already making inroads, he said.

Speaking with Lipis, author Martin Mayer of New York observed that the quality of Sears' 10-month-old corporate trade payments system may scare the Federal Reserve Bank.

Mayer blamed the Federal Reserve Bank for mishandling automated clearinghouses, which has set back U.S. EFT operations, particularly in areas such as direct payroll deposit. He noted that only 5% to 7% of U.S. payrolls are directly deposited, compared with 70% to 100% in some European countries.

But Mayer believes the banking industry is still strong enough to recapture the business it has lost to its competitors, particularly in the area of wholesale transactions rather than consumer-oriented EFTs.

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NEWS

March storms test data center disaster recovery plans

DP managers cope with tornados, power spikes, electrical outages



Morning commuters make their way along Massachusetts' Rt. 9 following storm.

By John Gallant
CW Staff

WASHINGTON, N.C. — Despite a killer tornado that raged across the countryside only five miles away, the data center at the National Spinning Co., Inc. here suffered only a momentary loss of power. But that was enough.

As one of Joseph Rose's staff members walked the 30 feet from his office to the computer room late in the evening of March 28, the lights flashed five times in rapid succession, and the data center's IBM Series/1 processor and two IBM Model 4963 disk drives went down — for good. For Rose, director of computer services for the $130 million yarn manufacturing company, it was the beginning of a DP nightmare and the first test of his disaster recovery plan.

He was not alone. While operations continued uninterrupted at most data centers contacted by *Computerworld*, other DP managers faced the uncertainties and the fears of equipment damage and data loss brought on by the winds and snow that ravaged East Coast states as March exited.

Though Rose was one of the few forced to implement disaster recovery plans, for National Spinning, having such a plan was critical. When National Spinning's processor and disk drives failed to come up automatically and manual restart attempts proved futile, Rose called on nearby IBM customer engineers for assistance.

After working most of the night, IBM personnel reluctantly conceded that both of the system's 64M-byte self-contained disks had, for unknown reasons, been destroyed. Inventory and manufacturing data vital to the company's 24-hour-a-day packing and shipping operations had been lost.

As replacement controller cards and disks were flown in from an IBM center in Greensboro, N.C., Rose set in motion a contingency plan to keep the packing lines running during the night. Inventory and shipping data were recorded manually, while packing slips and labels that would otherwise have been torn from the printers tied to the Series/1 were written up by hand.

Nearly a full day later, IBM service personnel had repaired the damaged equipment. Rose and his staff began initializing the disks and reloading data from backup diskettes created — fortunately — only two hours before the system failed. Information captured manually was then entered to bring the data files up to date after 36 grueling hours of downtime. Incredibly, no shipments were delayed.

"It was quite a learning experience," Rose said. "There were some minor flaws in our plan that cost us a few hours. Some small files, such as dates and report requests, weren't backed up properly and were lost irretrievably.

"Our manual contingency system worked fine, but there were little, nitty-gritty things that fell through the cracks because we hadn't practiced implementing the disaster plan."

In Needham Heights, Mass., MIS Director Lou Chiesa was in the midst of closing the financial books and preparing a payroll for the Ludlow Corp. early the afternoon of March 29, when the lights went out. The IBM 4341 mainframe in Ludlow's cold and darkened data center would be useless for the next two days, a situation that threatened to delay paychecks for some 3,000 workers.

"It was a critical period for us," Chiesa said. "We had to assess how long the power outage would last. On Friday, [Boston Edison Co.] told us the power would be on Saturday. On Saturday, they told us it wouldn't be on until Sunday. We finally decided Saturday morning that we couldn't count on luck, and we put our emergency plan into action."

Chiesa is also MIS director for Ludlow's sister company, Grinnell Fire Protection Systems Co. in Providence, R.I. At 9 a.m. Saturday, he and his DP staff armed themselves with flashlights and retrieved backup payroll, operating system and applications program tapes from Ludlow's data center and transported them to Grinnell, nearly an hour away.

After 12 hours of preparation, Chiesa had implemented Ludlow's payroll system on Grinnell's IBM 3031 mainframe. When the first paychecks rolled off the system during a mock processing run, Chiesa's staff members applauded.

A short time later, power was restored to Needham Heights, allowing Ludlow to complete its financial closing and payroll processing at its own data center on schedule.

"It proved to be an excellent exercise," Chiesa said. "Both of the mainframes operate with DOS/VSE under VM, which makes the data transportable. It costs me an extra $10,000 a year to maintain VM, but in this instance it was worth it. It's also fortunate that I could commandeer the Grinnell system so easily.

Faced with power spikes

About the time the lights went out in Needham Heights, Frank Smith was in a meeting with company officials to determine the best way to keep DP operations running smoothly in the face of repeated power spikes. Smith, senior vice-president of information systems for Shawmut Bank of Boston, was concerned about the electrical surges that had already interrupted processing on Shawmut's two IBM 3033 mainframes several times.

"In the midst of this meeting to determine whether to go on backup power," Smith said, "we hit another spike. We had already had five or six spikes, so this time we just stayed down. We went to our backup diesel generators and stayed on them all night until we were certain the power had smoothed out. We went back on regular electrical service at about 7 a.m. Friday."

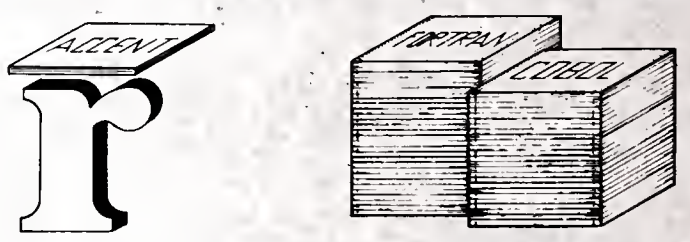
Smith said there was never any danger to equipment or data as a result of the power spikes. He estimated Shawmut lost only about 40 minutes of processing time during the transfer to and from backup power.

"I certainly wouldn't say it was a disaster. We simply wanted the assurance of a reliable power source. We ran normally all through the night."

Despite the flooding that washed across Manhattan's financial district at the height of the storm, New York data processing departments seemed largely spared any damage. Lower Manhattan's tight real estate market provided a measure of protection.

"We . . . have data centers in separate locations. That wasn't intended to provide us with backup, but that's how it works," Norbert Gottenberg, manager of information services at Lehman Brothers Kuhn Loeb, said.

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Microprocessors: the heart of the micro revolution

PRODUCT SPOTLIGHT

By Peter Bartolik
CW Staff

The lines of distinction among various types of processing hardware have narrowed in recent years as microelectronics technology has packed increasingly greater power into increasingly smaller boxes. This year and next, the differences between categories of processors seem likely to become even more obscure as very large-scale integration leads the microcomputer into the realm of the superminicomputer.

Literally at the heart of this ongoing revolution is the microprocessor, the tiny piece of silicon upon which engineers can now imprint as much circuitry as once filled room-size computers in the early days of data processing.

Starting with the 1972 introduction of Intel Corp.'s 4-bit 4004 and 8-bit 8008 chips, the microprocessor/microcomputer industry has evolved into a multibillion-dollar business. The total value of microcomputer systems sold to home and business is expected to capture more than 50% of the total information processing systems market by 1988, according to recent predictions by Infocorp, a California market research firm.

Microprocessor technology was introduced to the DP environment through the vehicle of the minicomputer, with mini vendors carving out a niche in the traditional mainframe market by offering smaller packages and lower prices. In mid-1977, Digital Equipment Corp. announced the PDP-8, based on a single chip. This year, DEC is expected to unveil what it has termed the "VAX-on-a-chip," which DEC President Kenneth Olsen told *Computerworld* late last year will have just about all the capability of a VAX-11/780 supermini.

While many hardware vendors have introduced their own microprocessors, it was merchant semiconductor vendors that fueled the 8-bit micro market. In the mid-1970s, Intel Corp.'s 8080 and 8085 chips and Zilog, Inc.'s Z80 and Z80A were sold to a variety of start-up micro companies. MOS Technology introduced its 6502 and spurred the continuing success stories of Apple Computer, Inc. and Commodore Business Machines, Inc. (Commodore later acquired MOS Technology).

Then, in 1981, IBM selected for its Personal Computer the Intel 8088 chip, which can internally process 16 bits of data, but transfers that data 8 bits at a time. The overwhelming success of the Personal Computer created unprecedented demand by other vendors seeking to make their new machines compatible with the burgeoning array of software being written for the IBM microcomputer.

Microprocessors

Model/ Manufacturer	Technology	Data Bus (Bits)	Internal Architecture (Bits)
Z80/*Zilog*	NMOS	8	8
6502/*MOS Technology*	NMOS	8	8
8060A/*Intel*	NMOS	8	8
8085/*Intel*	NMOS	8	8
8088/*Intel*	HMOS	8	16
8086/*Intel*	HMOS	16	16
Z8000/*Zilog*	NMOS	16	16
80166/*Intel*	HMOS III	16	16
80266/*Intel*	HMOS III	16	16
NS16016/*National Semiconductor*	XMOS	16	32
NS18032/*National Semiconductor*	XMOS	16	32
MC68000/*Motorola*	HMOS	16	32
MC68010/*Motorola*	HMOS	16	32
NS32032/*National Semiconductor*	XMOS	32	32
MC68020/*Motorola*	HMOS	32	32
Z80000/*Zilog*	NMOS	32	32
HP Focus/*Hewlett-Packard*	NMOS III	32	32
WE32000/*AT&T Bell Labs*	CMOS	32	32
NCR/32/*NCR*	NMOS	32	32
80386/*Intel*	HMOS III	32	32

CW CHART

Intel became the provider of choice for hardware vendors seeking a true 16-bit chip — the 8086 — that both processes and transfers 16 bits of data at one time. Now Intel is trying to keep up with demand for the 80186 16-bit chip, which combines on one chip the 8086 design with peripheral and support functions. The company has also released the more powerful 80286 16-bit chip for multiuser applications; the 32-bit 80386 chip expected this year is reported to feature demand-paged virtual memory and on-line memory support of up to 4G bytes.

The other players

Besides Intel, there are currently three other leading players in the chip game: Motorola, Inc.; Zilog, Inc.; and National Semiconductor Corp.

Motorola introduced its 68000 family, providing 32-bit internal processing with 16-bit data transfer capabilities, in 1979. Apple selected the 68010 16/32 for Lisa, its highly touted but low-selling system. In January, however, Apple introduced the Macintosh with the same chip, and that product seems poised to ensure Motorola's position as chief challenger to the Intel products.

Motorola also has announced the MC68020 with 32-bit transfer and processing capability.

Although Zilog was a chief player in the 8-bit arena, its 16-bit Z8000 chip "just missed it," according to William F. Zachman, vice-president of International Data Corp., the Framingham, Mass.-based market research firm. Exxon, which acquired Zilog, "showed an incredible ability to turn gold into lead," Zachman added.

Zilog, however, has announced a 32-bit chip, the Z80,000, which it said will be available early next year with virtual memory implemented in hardware.

The other major player in the chip game, National Semiconductor Corp., is in the running in the 32-bit market, but "is unlikely to overtake the rest of the world," Zachman said. National Semi has a family of 16/32-bit chips and has also announced the NS32032 with 32-bit transfer and processing capability.

While Intel, Motorola, Zilog and National Semi are the best-known names in the chip game, other players seem poised to enter the action.

AT&T, for example, has a 32-bit microprocessor, the WE 32000 — formerly Bellmac 32000 — and recently announced a successor, the WE 32010. Although it is only used on AT&T Technologies' products at this time, it is something that has to be counted in, Zachman said.

See **CHIPS** page 16

Software developers look to users

While microprocessor vendors and microcomputer vendors debate the relative merits of particular chips, the software developer is more concerned about how many end users will be using a particular machine.

Software developers need an incentive to devote resources to a particular microprocessor, according to Camino Wilson, president of Lifetree Software, Inc. in Monterey, Calif., and author of the Volkswriter word processing package. The incentive can take the form of direct compensation from a microcomputer vendor or an ironclad market share of users who need application packages.

"We'll gamble," Wilson said, "on the [Apple Computer, Inc.] Macintosh; that's a reasonable gamble." In addition to the market potential of the Macintosh, Apple was very forthcoming in providing information on the hardware to developers, he said.

Writing software for more than one microprocessor "is pretty awful" because different versions of source code are needed for each model and there are few "mature compilers" available to ease the work load, Wilson said. When there is an existing market, he added, there are more tools available to the developer.

Developers who work in higher languages, such as Pascal and C, he said, find the task of working on more than one microprocessor easier than those who work in assembly language.

Chip vendors gird for 32-bit battle

By Peter Bartolik
CW Staff

While the 16-bit microprocessor market has barely had time to gel, semiconductor vendors are already aggressively positioning themselves to gain the dominant spot in the 32-bit microprocessor arena.

At Motorola, Inc., where the 16/32-bit 68000 seems destined to ride Apple Computer, Inc.'s Macintosh to success, the emphasis is now on upward mobility. Motorola has created a processor that, it maintained, can accommodate changing needs for on-board peripheral and support functions. "With the 68000 family, we took the tack that all code should be upward-compatible," James Farrell, manager of technical communications, said.

Motorola believes its principal 32-bit rival, Intel Corp., has made a strategic error by trying to design into new 16-bit chips some level of compatibility with the earlier 8088 and 8086 microprocessors.

At Zilog, Inc., where the highly successful Z80 was followed by a less successful Z8000, the emphasis is on on-board memory management, with virtual memory capabilities built into the chip. The company is also stressing ease of use; the chip can be adapted for fast or slow applications to meet particular needs, Peter Ashkin, advanced systems marketing director, claimed.

Ashkin believes the 8088 phenomenon — in which IBM's entry into personal computing created a dominating standard — is unlikely to recur in the 32-bit arena. Zilog expects that 99% of all applications packages for 32-bit microprocessors will be written in high-level language which, Ashkin pointed out, "makes [the applications packages] transportable" to competing microprocessors.

The introduction of 32-bit machines will revolutionize the market in 1985 as the entry of the Intel 8080 and Z80 did in 1975, Ashkin predicted. "We're not offering an incremental increase in performance; we're offering an order of magnitude increase in performance," he said, pointing out that 32-bit machines will be able to program for environments of up to 4G bytes of memory.

With each semiconductor vendor cramming more and more functions onto the microprocessor chip, the capacity for even greater integration still appears to be unreached.

Paul Penfield, a professor in MIT's electrical engineering and computer science department and head of MIT's microsystems program, said the limit to the density of microprocessor chips is about 100 million transistors. "We are now in the neighborhood of 100,000 transistors, a few hundred thousand in the most advanced chips."

Motorola's Farrell said some theories have been formulated about stacking or piling circuits on top of each other on a particular chip. "We're already seeing capacitors being put on edgewise," he noted.

Farrell sees a practical limit of four million to five million transistors for a single piece of silicon. "We're optimistic we can do that," he added.

Business schools to benefit from $25 million IBM grant

ARMONK, N.Y. — IBM has launched a $25 million grant program to coax business schools into beefing up instruction in information systems management.

Twelve graduate schools of business administration, to be selected next year, will be awarded five-year grants of $1 million each and will also receive about $1 million worth of IBM data processing machinery, Big Blue said in announcing the program last week.

"Our aim is to encourage business and management schools to develop more graduates who clearly understand the role information systems will play in coming years.

"We hope the schools will achieve that goal by improving the quality of instruction and expanding course offerings and research in [the information systems] field," John R. Opel, IBM chairman, said in a prepared statement.

IBM pointed out that the grant program is similar to a 1982 series of grants given to engineering schools to improve education in manufacturing engineering.

Judge reinstates charges

Against trio in IBM-Hitachi case

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — Criminal charges have been reinstated against three defendants who allegedly participated in a conspiracy to steal proprietary IBM systems technology and transport it to Tokyo-based Hitachi Ltd.

Federal Judge Robert Aguilar abused his discretion in 1982 when he dismissed conspiracy charges against the trio, the Ninth U.S. Circuit Court of Appeals here concluded in a recent ruling.

The federal appellate court cited Aguilar's abuse as the reason behind its decision to reopen the case against Tabassom Ayazi, Raymond Cadet and Barry Saffaie.

All three were arrested and indicted in mid-1982 for allegedly trying to pass selected volumes of IBM's Adirondack Hardware Design Workbooks to Hitachi, one of Big Blue's chief Japanese competitors in the large-scale mainframe arena.

Bolstered Hitachi efforts

The confidential workbooks, which describe the architecture and other technical details of IBM's latest generation of CPUs, might have greatly bolstered Hitachi's efforts to compete in the mainframe field, according to federal prosecutors. But the desired workbooks never found their way into the Japanese vendor's hands.

Instead, they were intercepted by federal law enforcement agents who allegedly bought the materials from the defendants while posing as electronics black marketers.

Seizure of the documents helped bring to light an alleged conspiracy that eventually resulted in indictments against Hitachi, Mitsubishi Electric Corp. and more than 20 of their employees or purported agents. Among the "sting" victims were Ayazi, an Iranian college student; Cadet, a former IBM engineer; and Saffaie, who previously worked for Hitachi's National Advanced Systems Corp. subsidiary in the U.S.

Most of the defendants, including Hitachi, pleaded guilty to the charges and received the maximum sentence under American law.

The indictments also prompted IBM to file a civil lawsuit against Hitachi, which settled the dispute out of court after agreeing to terms highly favorable to its American rival.

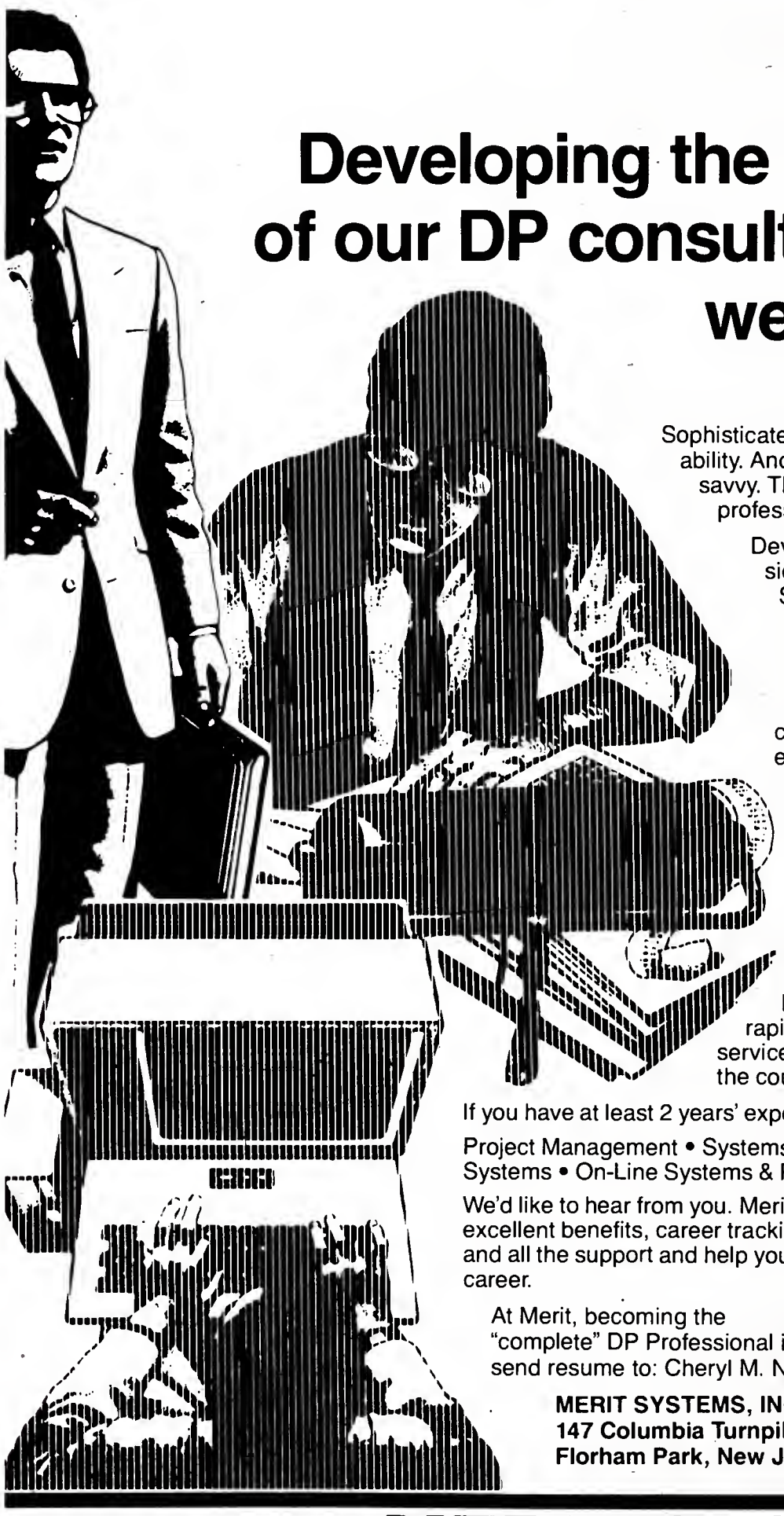
But the portion of the case dealing with Ayazi, Cadet and Saffaie was soon dismissed when the U.S. attorney's office here refused to furnish the defendants with case documents that purportedly might have aided them in their defense. The dismissal itself, however, was then overturned by the local U.S. appellate court, which faulted Aguilar for exceeding his judicial authority. As part of its ruling, the appeals court also endorsed the idea of requiring the prosecution to surrender its case documents to Aguilar and allow the federal judge to review their contents.

CHIPS from page 15

Intel, Motorola, Zilog, National Semi and AT&T probably will occupy just about all the competition that the market can bear, Zachman said.

There are others to watch, however. NCR Corp. produced its own 32-bit microprocessor and support chips, the NCR/32s, and has packaged them in the NCR 9300, a 50-lb machine said to have twice the power of the I-9020. The company has also signed an agreement for Honeywell, Inc. to use the chips.

Hewlett-Packard Co. has developed its own 32-bit chip, which it uses in its HP 9000 workstation. Also expected is the DEC VAX-on-a-chip.



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WASHINGTON UPDATE
Jake Kirchner
and Bryan Wilkins

IBM shooting suspect declared fit for trial

WASHINGTON, D.C. — Edward Thomas Mann, 39, a former IBM employee who drove his car into an IBM building and then opened fire with a machine gun, killing three people and wounding nine, is mentally competent to stand trial, a Maryland county circuit court judge has ruled.

The shooting incident took place in May 1982 at an IBM facility in a nearby Maryland suburb. Since that time, Mann has been undergoing psychiatric evaluation.

Initially, medical authorities determined Mann was not mentally competent to face charges, but since being placed on medication last October after assaulting his own doctors, he has subdued his delusions that IBM is involved in a conspiracy to take over the world, his psychiatrists said. Court-appointed psychiatrists previously determined the existence of the delusions.

A Maryland state psychiatrist told Montgomery County Circuit Court Judge William Miller that he is unsure whether Mann has actually improved as a result of the treatment or is bluffing in order to take his case to court. Miller set the trial for Sept.24.

Smart card tech touted to House committee

WASHINGTON, D.C. — Smart card technology can provide a high level of security in on-line financial transactions, according to testimony recently presented to a House of Representatives subcommittee considering credit card and computer fraud legislation. The subcommittee is considering the Counterfeit Access Device and Computer Fraud and Abuse Act of 1984, legislation that would penalize persons using credit cards or computers for fraudulent purposes.

If smart cards were utilized, computer terminals and communications networks linking individuals with financial institutions would not have to rely on security systems; an embedded integrated circuit can reliably establish the authenticity of the card and the identity of its bearer, according to Stephen Weinstein, American Express Co.'s vice-president for technology strategy.

Weinstein, who is chairman of the American National Standards Institute working group on integrated-circuit cards, told the House Judiciary Subcommittee on Crime late last month that data from the transaction can be entered directly into the chip in the card, eliminating the need for a printer at the terminal. "Withdrawal of the card would 'depersonalize' the terminal, leaving no trace of the user's private codes and information and thus discouraging attempts at fraud by other users or by personnel maintaining the terminal," he said.

CAB posts plan to bar CRS bias by carriers

WASHINGTON, D.C. — The Civil Aeronautics Board (CAB) has issued a set of proposed regulations to ban bias in the computer reservations systems (CRS) that airlines provide travel agents.

The rules would mandate that schedules displayed on the CRS terminals give no preference to the flights of the carriers that provide the system and would regulate pricing of CRS services and other aspects of the relationships between travel agents, CRS providers and airlines that do not offer their own CRS services.

Most agents use the CRS services of American and United Airlines. Carriers without their own systems can, for a fee, have their schedules carried on existing systems. The CAB and the Justice Department concluded, after independent investigations, that there is merit to long-standing complaints that CRS providers have sometimes biased their systems in favor of their own schedules and in some cases made it prohibitively expensive for other airlines to obtain access to the systems.

The CAB asked for comments on its proposed rules and on a related proceeding to develop rules for specifying the way in which connecting flights are selected and arranged for display on CRS terminals. Comments on the two proposals are due April 26. Copies of the rules and more information can be obtained from either Robert D. Young or Samuel E. Whitehorn, Civil Aeronautics Board, 1825 Connecticut Ave. N.W., Washington, D.C. 20428.

Guide published for Cobol-80 users

LITCHFIELD, Conn. — Jerome Garfunkel Associates, Inc. has published a guide to the Cobol-80 programming language.

Among the listings in "The Cobol-80 Guide" are changed features from Cobol-74, all new reserved words and the obsolete language elements with explanations.

The guide also contains a skeleton format of Cobol-80, according to a spokesman for the publisher. One section of the guide discusses the future of Cobol and includes a list of features that eventually may be added to the language.

The guide costs $18.40.

"The Cobol-80 Guide" may be obtained from Jerome Garfunkel Associates, Inc., which is located at Cobble Court, Litchfield, Conn. 06759.

Manual out on Dbase II

ESTILL SPRINGS, Tenn. — Associated Technology Co. has published "Dbase II Coding Guide," a 46-page reference manual designed to help software departments in the formulation of microcomputer data base standards.

The guide provides a set of company standards and examples. The manual ensures top-down program construction, testable programs and easy maintenance, according to the vendor.

The guide sells for $22 from Associated Technology, which can be reached through Box 448, Estill Springs, Tenn. 37330.

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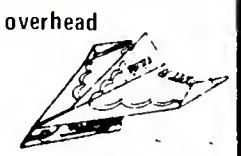
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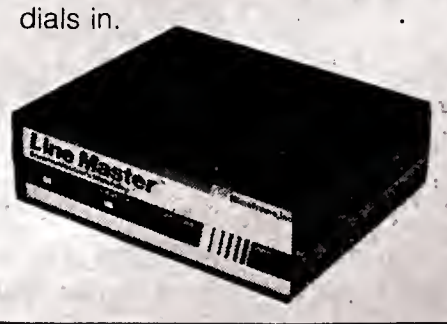
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NEWS

Mass. governor to introduce strong computer crime bill

By John Gallant
CW Staff

BOSTON — Massachusetts Gov. Michael Dukakis is expected this week to present to the state legislature a computer crime bill that officials of the Bay State's high-technology companies are hailing as one of the nation's most comprehensive.

Drafted by Lt. Gov. John F. Kerry, the legislation is based on recommendations drawn from more than 600 users, computer security experts, educators and criminal justice and legal authorities. If it is passed, the state's hackers and computer criminals will face severe penalties and a restitution program that may include community service.

According to Jonathan Winer, counsel to Lt. Gov. Kerry, the bill creates two categories of computer fraud. It defines first-degree computer fraud as the accessing of any computer system to obtain goods and services illegally or to execute a scheme to defraud. Altering, destroying or preventing access to a computer system also falls within the realm of first-degree computer fraud, which would be punishable by a fine of up to $20,000 and a maximum five years in prison.

Second-degree fraud, targeted toward hackers, is defined simply as accessing a computer system or data base without authority and is punishable by fines of up to $5,000 in a one-year period.

The bill also includes civil provisions that would empower judges to impose injunctions on offenders before criminal proceedings are initiated. Those provisions would also make convicted violators liable for triple damages in subsequent civil suits brought by victims.

The bill's restitution plan would force offenders to reimburse victims, either financially or through a work program outlined by a judge.

According to Winer, the state legislature addressed the issue of computer crime last year by amending the state's larceny statute to include theft of electronic data — an effort that many legal and data processing experts felt was insufficient. "The legislature was ready to pass something more comprehensive last year, but there was no consensus in the high-tech industry. . . . I'm convinced that consensus exists this time," Winer noted, adding, "But this is a short legislative session filled with some very important issues. I can't guarantee passage this year."

Winer said the bill includes a unique definition of what constitutes a computer. As outlined, a computer is "any manufactured device which performs logical, arithmetic and memory functions."

"We really wrestled with the language so that users and judges would feel comfortable with it. We didn't limit the definition to only electronic devices because we wanted to include whatever technologies emerge in the future," Winer said.

Favorable response

The legislation received a highly favorable response recently when it was unveiled before the governor's Anti-Crime Council, a coalition of state district attorneys, judges, police and corrections authorities. At that meeting, attorneys and security officials from Massachusetts' high-tech firms gave their backing to the bill, which was described as the most far-reaching state legislation to date.

The bill "attacks computer crime on several different fronts, and it provides the victim with both criminal and civil relief. It addresses a concern that all manufacturers share, namely, that we don't want to see our products misused and abused," said Richard Guilmette, manager of corporate security and safety for Natick, Mass.-based Prime Computer, Inc.

Guilmette's views were echoed by Harvey Burstein, corporate director safety/security-staff attorney for Data General Corp. of Westboro, Mass. "This bill is much tougher and broader than laws in other states. Also, I think it provides a good model for federal efforts, most of which seem to be hanging in the lurch right now," Burstein said.

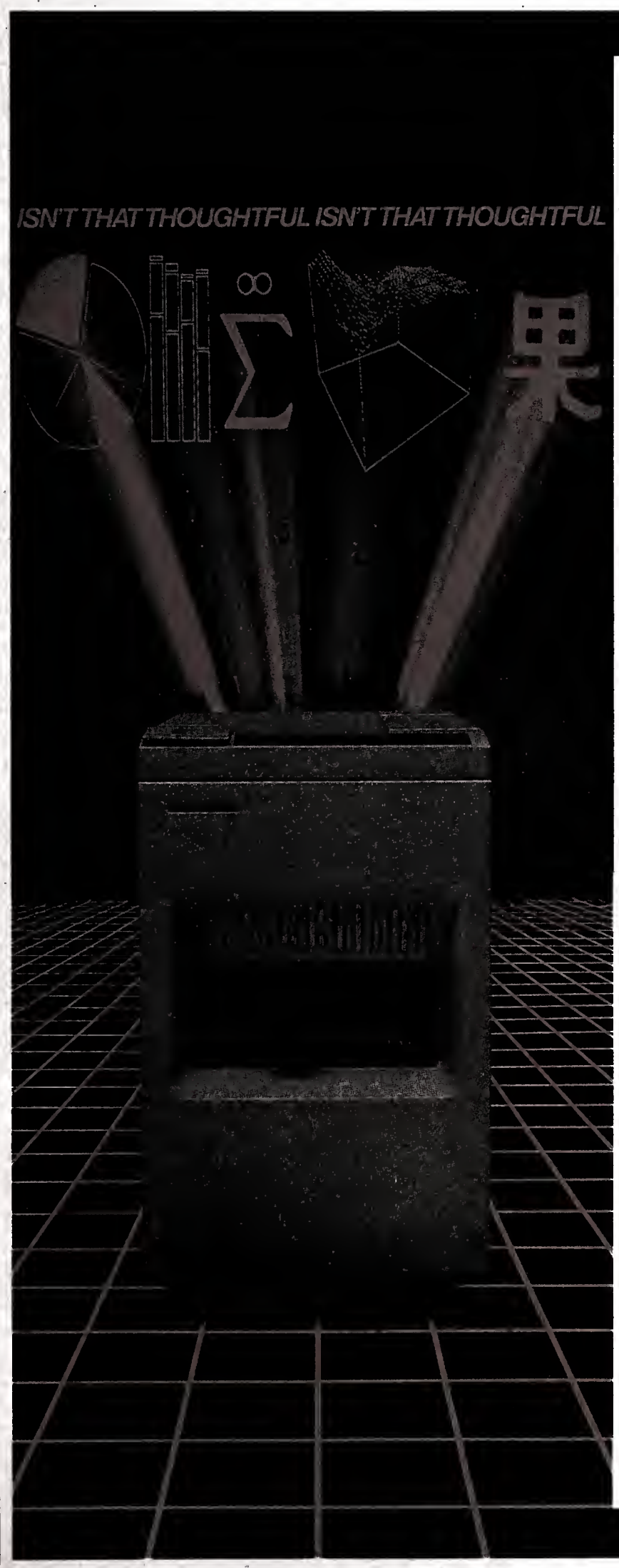
Government DP expo set for June

WASHINGTON, D.C. — Government Computer Expo '84, dedicated to end-user computing and microcomputers and their applications in government, will be held here June 26-29.

In addition to exhibits, the expo will feature a technical program of tutorials, briefings and workshops.

Session topics include "The Unix Operating System," "Technological Innovations," "Microcomputer Software Acquisition Management" and "Networks and Microcomputers."

Registration fees for the full conference are $385 (government) and $460 (industry). Further information is available from Government Computer Expo '84, 1620 Elton Road, Silver Spring, Md. 20903.



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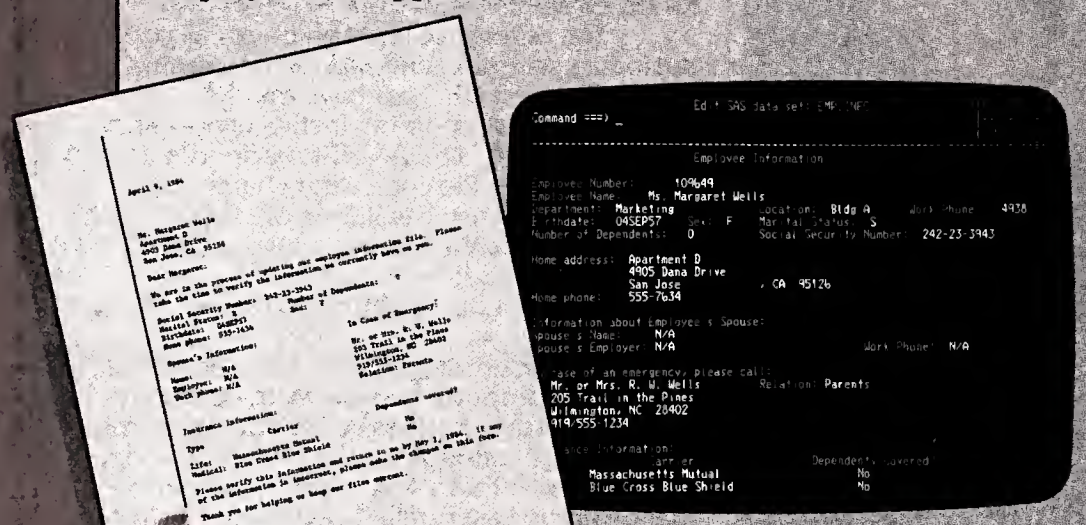
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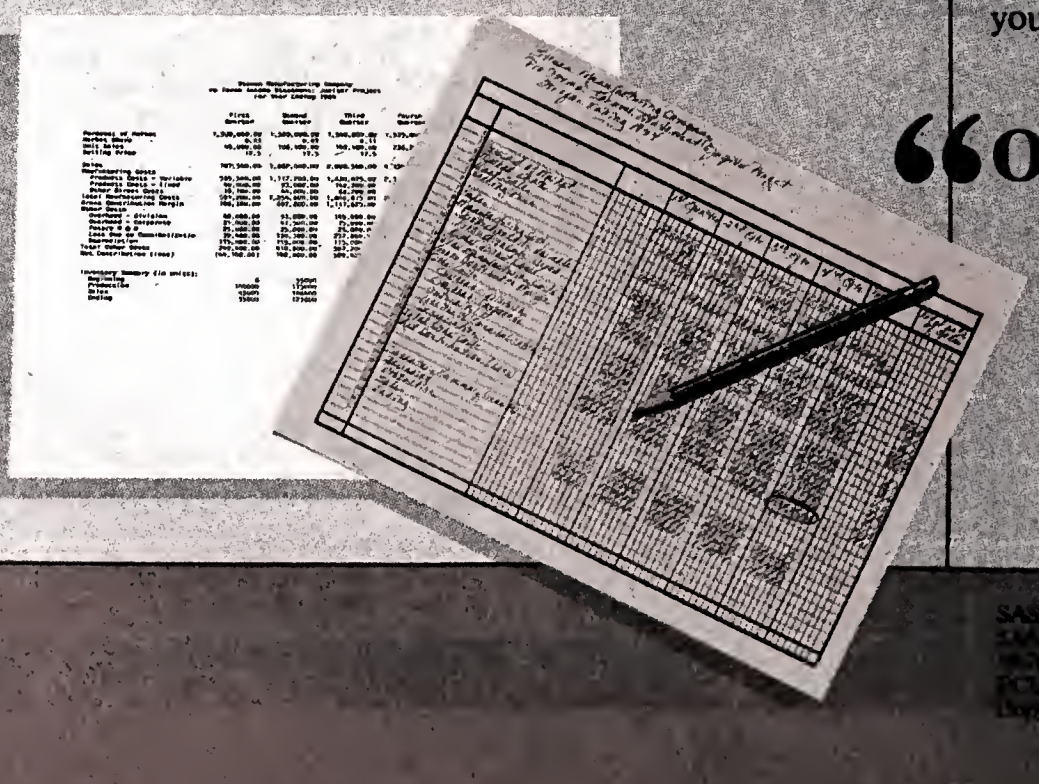
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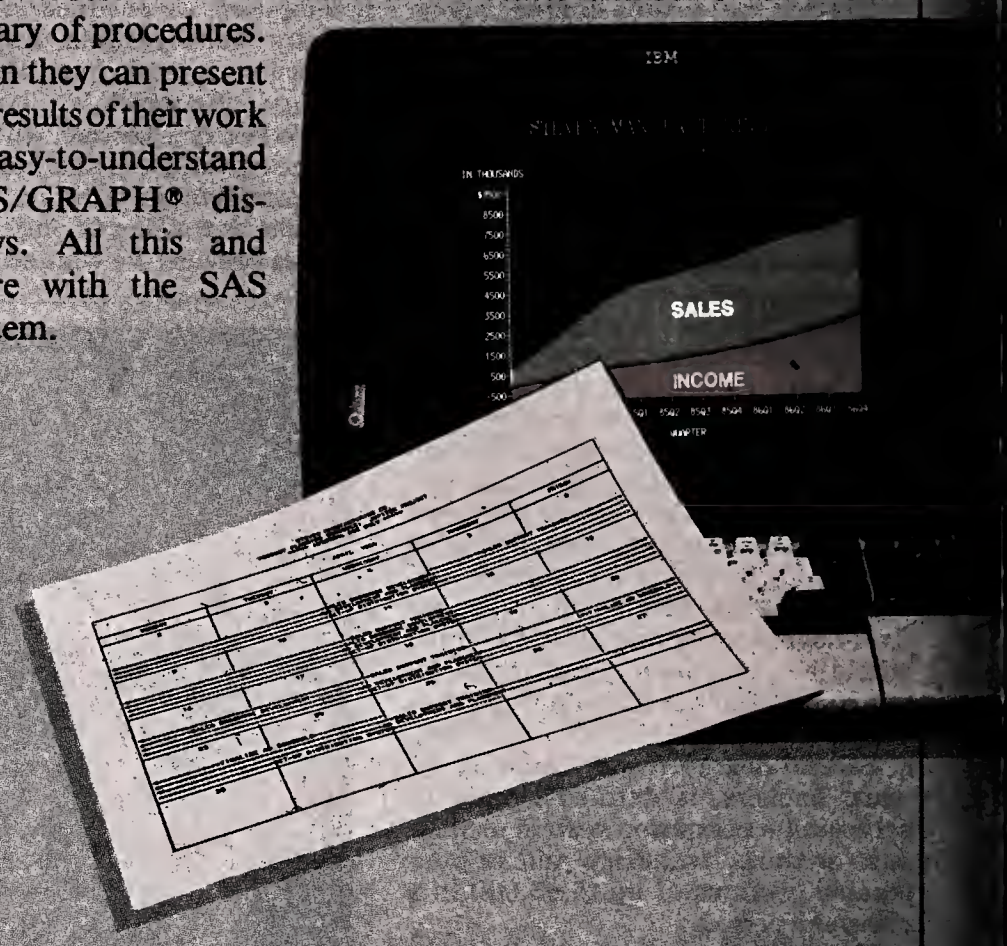
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The Solution for Your Information Center

The SAS Solution for Programmers

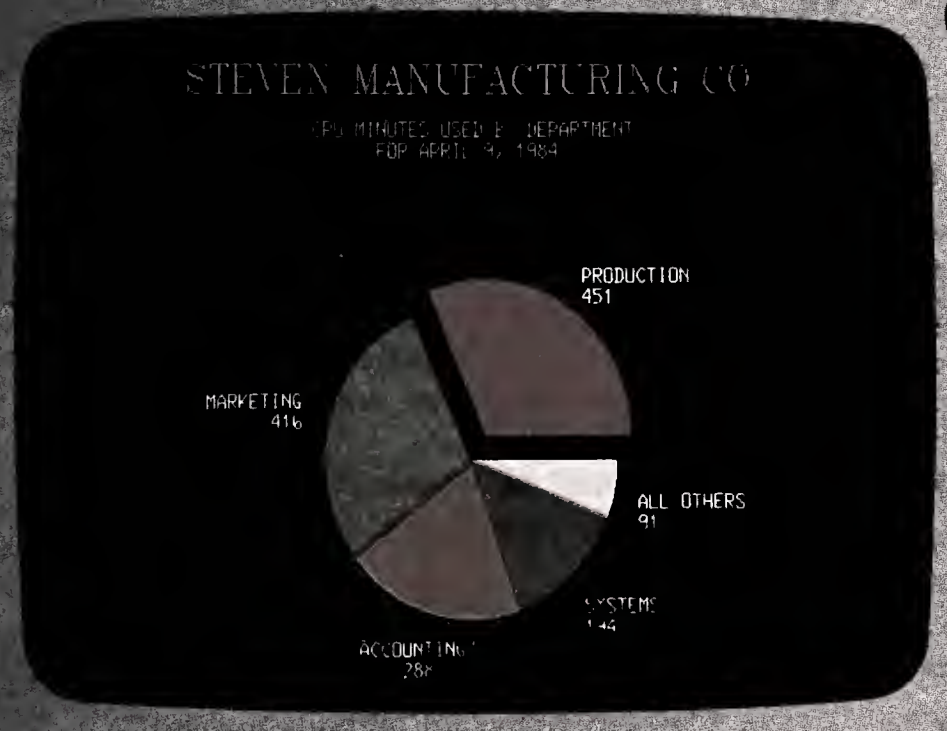
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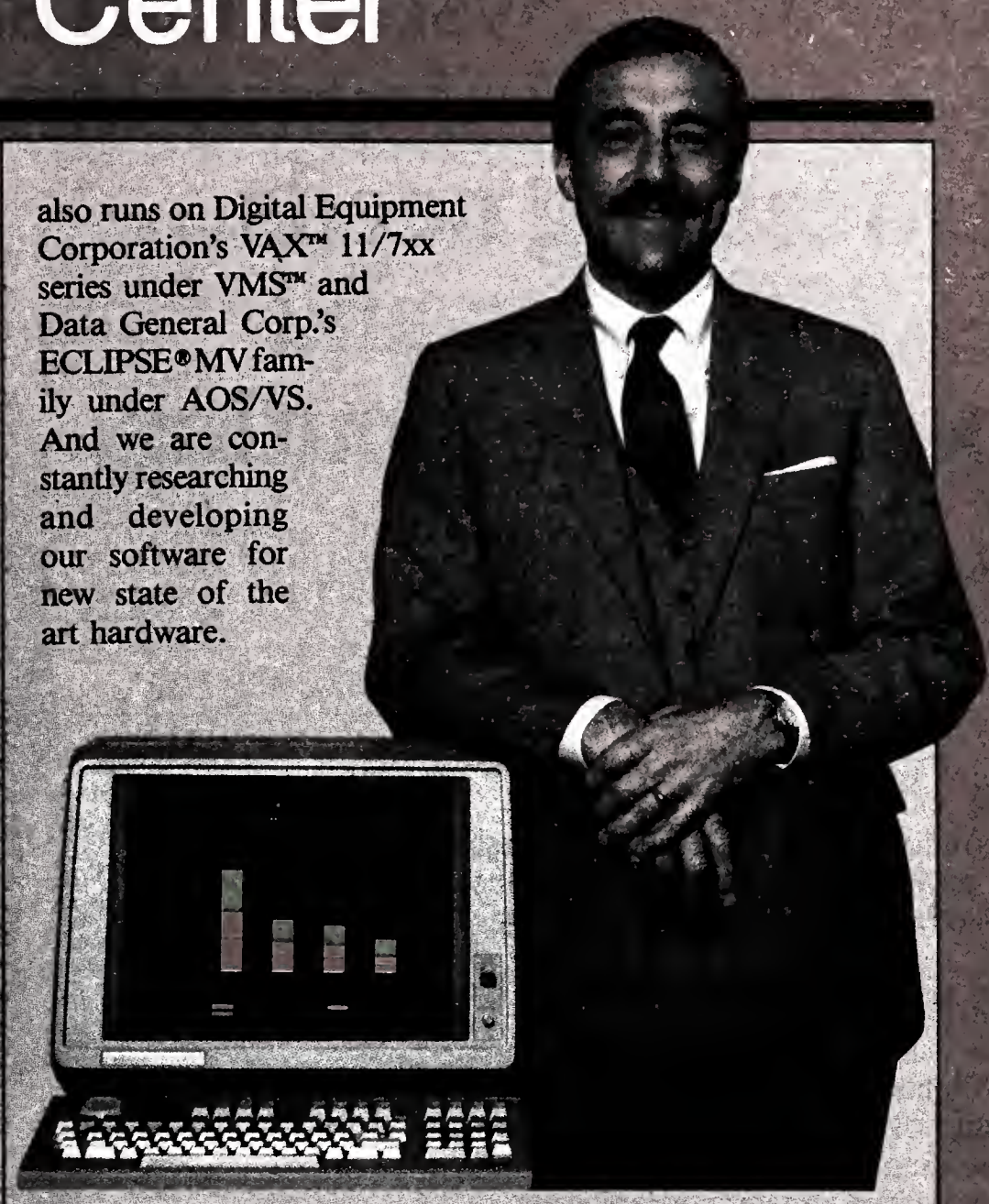
STEVEN MANUFACTURING CO.
VSE SYSTEM USAGE BY DEPARTMENT
FOR APRIL 9, 1984

		CPU MINUTE			I/O COUNT	
		NUMBER OF EXECUTIONS	SUM	MEAN	SUM	MEAN
DEPARTMENT	JOBNAME					
ACCOUNTING	JACCT110	3	31.42	10.44	11378	3791
	JACCT210	7	38.97	5.57	34968	4995
	JACCT220	6	103.95	12.99	74337	9280
	OTHERS	25	119.76	4.55	56085	2243
HUMAN RESOURCES	OTHERS	18	31.08	1.72	50316	2795
LEGAL	OTHERS	16	72.00	1.06	8218	514
MARKETING	JMKTG170	3	31.35	10.45	13557	4519
	JMKTG300	9	149.36	16.15	159131	17681
	JMKTG215	4	82.33	10.29	41748	5469
	JMKTG220	7	67.01	9.57	138357	18904
	OTHERS	21	89.95	4.28	100660	4804
PLANNING	OTHERS	17	43.00	2.53	27479	1616
PRODUCTION	JPROD200	12	80.67	6.71	107271	8938
	JPROD500	7	170.00	24.29	89080	12717
	JPROD650	5	58.15	11.99	91561	22890
	OTHERS	26	162.18	5.92	106352	4513
SYSTEMS	JSYS525	4	36.47	9.62	28519	5630
	JSYS620	9	29.52	3.13	39812	9803
	JSYS700	5	97.26	11.89	61780	10465
	JSYS950	4	49.67	12.42	80256	10068
	OTHERS	17	33.88	1.98	114291	8723
ALL JOBS		222	1440.00	6.49	1366608	6156



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NEWS

INTERNATIONAL REPORT
CW International News Network

AUSTRALIA

SYDNEY — An on-line credit management system developed for in-house use by Grace Bros. Pty. Ltd. here will be marketed by IBM Japan Ltd. With the help of IBM's Software Development and Support Center established in Sydney last year, Grace plans to seek additional markets for its software products in Europe and the U.S.

■

CROWS NEST — Australia is rumored to be the launchpad for the entry of ICL Co. into the market for Pick & Associates, Inc.'s Pick operating system. ICL reportedly plans the mid-year release of a Pick-based supermicrocomputer that, later in the year, will also be used to consolidate ICL's Unix thrust.

■

MELBOURNE — Following its recent deal to provide electronic funds transfer switching equipment to the State Bank of Victoria, Quadstar Corp. has lined up two more Australian customers and has laid plans to establish a subsidiary here. The two customers reportedly are a West Australian bank and a Victorian retailer.

BRAZIL

SAO PAULO — About 15,000 people were said to be on hand for Brazil's second annual Micro-Festival here two weeks ago. The event was comprised of both exhibits and sessions where market trends were discussed. The number of exhibitors reportedly increased 50% over last year.

CHINA

BEIJING — In 1983, both computer revenues and profits in China leaped 63% over the previous year, according to a recently released report. Sales of large and medium-scale systems increased by 64%, while microcomputer revenues jumped 130%, and the peripherals market increased a whopping 259%, the study said.

FRANCE

PARIS — France's Bull and Japan's Nippon Electric Co. Ltd. (NEC) will swap technology for a minimum of 10 years and integrate their respective product lines under the terms of a recently completed long-term agreement. At the same time, NEC penned a similar research and development agreement with the U.S.' Honeywell, Inc. The agreements call for the three companies to work together to integrate NEC's large-scale S1000 system and Honeywell's Gcos operating system software with Honeywell and Bull peripherals and communications systems. The system that results from these efforts is expected to be available in late 1985 or early 1986.

JAPAN

KANAGAWA — Marantz in Japan, Inc. has alleged that vendors of Unix and Unix-related equipment have stolen the Unix trademark from Marantz. The maker of audio equipment said it registered "Unix" as the brand name for its radio cassette recorder in 1962. AT&T International Japan is expected to hand down the public opinion on this claim on April 5.

■

TOKYO — IBM Japan Ltd. posted 1983 revenues of $260 million and showed a growth rate of 26%. A spokesman for the company attributed IBM's good year to the success of the IBM 5500 Personal Computer and the IBM 3080 series. IBM Japan employed about 14,189 people as of year-end 1983.

NETHERLANDS

AMSTERDAM — Following IBM's European price cuts on its Personal Computer product line, many other vendors are following suit. Both Digital Equipment Corp. and Hewlett-Packard Co. have announced price cuts by as much as 25% on their small systems, according to sources.

■

AMSTERDAM — Philips Information Systems, Inc. has made moves to strengthen its position in the communications marketplace by announcing an office automation and communications software package. Philips also intends to integrate its Data Systems and Telecommunications divisions into one corporate entity and bring to market one strategic product: an IBM Personal Computer-compatible microcomputer. The system is rumored to be based on the Corona Data Systems Corp. microcomputer and will be manufactured by Philips' Canadian subsidiary, Micon.

WEST GERMANY

MUNICH — In an attempt to break IBM's market stronghold here, 12 major European vendors of information technology hammered out an agreement to introduce common standards for open data communications based on proposals from the International Standards Organization and the Consultative Committee on International Telephone & Telegraph. The manufacturers — AEG-Telefunken, Inc., Nixdorf Computer AG and Siemens AG from Germany; Bull, Generale D'Electridite and Thomson-Brandt from France; International Computer Ltd., ICL Co. and Plessey, Ltd. from the UK; Italy's Olivetti and Sted; and Philips Information Systems, Inc. of the Netherlands — declared their intention to put together a catalog of compatible telecommunications products by 1985.

■

FRANKFURT — A study group composed of DP managers and organizational specialists concluded that DP managers might be in trouble due to the influx of microcomputers in large companies. "DP managers who cannot get rid of their time-intensive

See **DIGEST** page 26

System glitch brings Chicago exchange trading to grinding halt

CHICAGO — Trading on 20 futures markets of the Chicago Mercantile Exchange was halted for 2½ hours last month because of a computer malfunction which drastically slowed the system's response time.

The glitch was caused by a combined hardware and software failure, according to Douglas Skinner, manager of data processing operations for the exchange. Skinner declined to elaborate on the malfunction's cause. The exchange's data processing department has nine IBM Series/1 computers, which run software developed in-house.

The malfunction, which occurred at about 9:20 a.m. (CST) on March 16, reportedly brought delays of up to 20 seconds in the computers' posting of changing prices on the exchange's display board. Response time, usually only two seconds, is critical in trading, where points on a contract fluctuate in seconds and are worth as much as $25 each, according to Chicago Mercantile Exchange spokeswoman Pat Campbell.

Halted trading

The exchange halted trading from 9:35 a.m. to 12:05 p.m. (CST), by which time Skinner said the problem had been isolated and repaired. It was the first time since 1979 that trading had been halted on the exchange, Campbell said.

Volume on the Chicago Mercantile Exchange for March 16 totaled 151,468 contracts traded. On the previous Friday, 215,089 contracts changed hands.

Since trading continued at other U.S. mercantile exchanges, Chicago traders were unable to cope with rises and falls in futures contract prices during the trading halt. Campbell said traders suffered losses when they were unable to unload contracts which were dropping in price, but added that no accurate estimate could be made of the amount of traders' income lost since "every single contract is measured differently."

Al Kopin, president of Glass, Ginsburg, Ltd., a firm trading on the Chicago Mercantile Exchange, said no assessment had been made of his firm's losses, if any, and that it was unlikely such an assessment would be made. "It's always frustrating to have the market close down," he added.

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NEWS

High-speed telecommunications enters Olympic arena

By Lynn Haber
CW Staff

LOS ANGELES — What is becoming the 24th event in the Summer Olympics to be held here is the entry of modern, high-speed telecommunications technology in the Games.

Less than two years ago, the Los Angeles Olympic Organizing Committee (Laooc) was a handful of employees with nothing more sophisticated than electric typewriters. Today it is a planning organization made up of hundreds of employees utilizing $50 million worth of computers and other high-technology equipment.

AT&T Technologies, Inc., IBM, Motorola, Inc., Pacific Bell, Swiss Timing Ltd., Xerox Corp. and MCI Communications Corp. are the major technology suppliers in data processing and communications at this summer's Games. The technology will aid in recording and reporting the results of the Games' events for the approximately 50,000 Olympic family members, who include athletes, coaches, organizing staff and members of the media.

Some of the technological innovations in store for the Olympics include:



■ An AT&T-provided Electronic Messaging System (EMS) that will connect the Olympic Villages and sports venues from Santa Barbara to Fairbanks Ranch in San Diego County. In addition to the Laooc, others who will have access to the system include athletes, coaches and trainers; the press; the International Olympic Committee; and the individual national Olympic Committees.

The EMS will connect 60 Olympic sites within a 4,500-square-mile area. It includes 14 AT&T 3B20S superminicomputers; more than 100 Infotron Systems Corp. Model 782 network concentrators; 1,700 Teletype Corp. Model 5410 asynchronous terminals, which operate at full or half duplex at speeds up to 19.2K bit/sec; plus 300 printers.

■ MCI International is working with AT&T to allow telexes to be sent directly from EMS terminals through local computers and abroad. These will include foreign news stories composed on the EMS. MCI will also provide regular telex machines and printers at the press center for those who do not want to send their stories on the EMS.

■ Pacific Bell reportedly has moved up the installation of its fiber-optic digital light-wave system in Southern California, adding thousands of phone and data communications lines for the Olympics. The system will link all elements of the communications network, including radio paging and international telex services.

■ IBM is providing 200 Personal Computers, 190 Displaywriters — the computers used for ticketing, transportation and accommodations — and a voice messaging system (IBM's Audio Distribution System) accessible to people who speak 10 different languages (English, French, Spanish, German, Mandarin, Russian, Korean, Portuguese, Japanese and Arabic).

Again, the system will be accessible not only to the Laooc, but to everyone who is accredited to the Olympic Games.

■ Xerox will supply hundreds of copiers both for administrative needs and for immediate printout for the press at sports venues during the competition. The company is also supplying telecopiers and the printers for printing results.

■ Motorola is supplying 1,500 pagers with digital display capabilities of up to 160 characters and 1,500 pagers that signal with a beep when the wearer receives a call.

The company is also supplying more than 2,000 portable radios to support construction, medical services, sports, transportation and security operations before and during the Games. Some 300 mobile car radios are also being provided.

■ Swiss Timing created as the combined efforts of Omega and Longines in 1972, is providing the equipment to measure athletic performance and timing periods.

Mobile lab to monitor athletes' training efforts

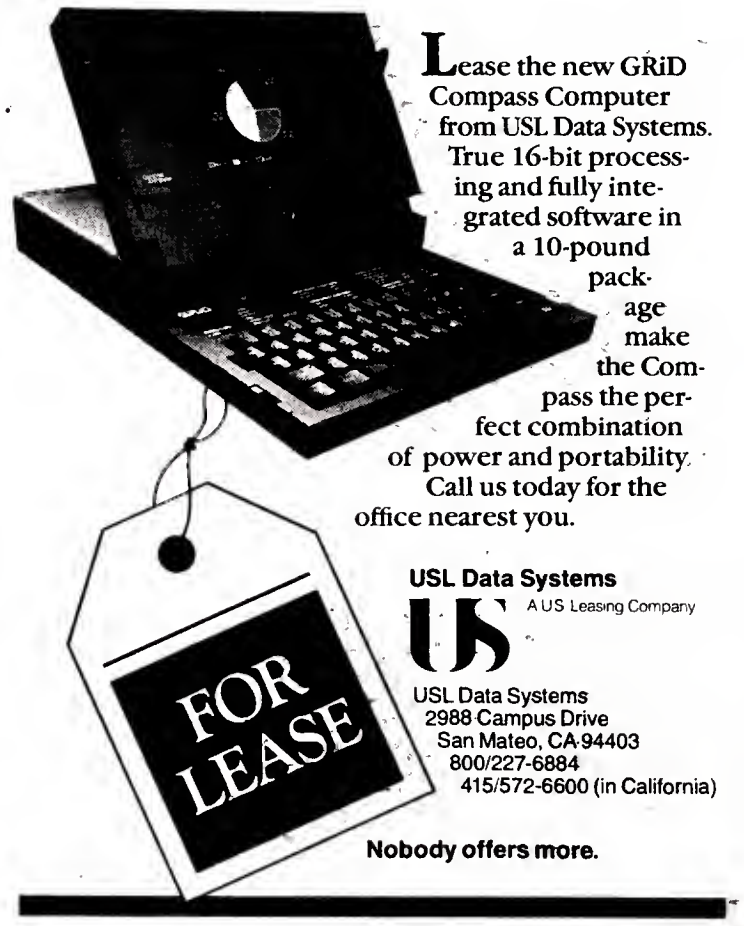
COLORADO SPRINGS — A mobile laboratory with $50,000 worth of computer-based medical instrumentation on board will be utilized for the first time by the Los Angeles Olympic Organizing Committee for testing athletes on training effectiveness.

Moving away from previous testing procedures, which involved the use of stand-alone analyzers and manual processing of data, the automated testing devices on the mobile lab include a Gould, Inc. 9000IV pulmonary exercise lab and IM1000 computer monitor with supporting software, used for the observation and analysis of vital cardiopulmonary signs.

Gould, Inc. and the Gould Foundation have donated equipment and monetary support for the U.S. Olympic Committee Sports Medicine Mobile Laboratory.



The U.S. Olympic Committee Sports Medicine Mobile Laboratory



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Micro network to host Coca-Cola's Olympics guests

By Lynn Haber
CW Staff

LOS ANGELES — To help accommodate more than 4,000 company guests with everything from hotel and transportation arrangements to dining and entertainment at this summer's Olympic Games, a major U.S. soft drink company will utilize a microcomputer network. Coca-Cola USA, the domestic soft drink division of the Coca-Cola Co. and the official Olympic soft drink supplier, will run what it has dubbed the Olympic System — three IBM Personal Computers and PC/Focus, a fourth-generation application generator and data base management system from Information Builders, Inc. — to ensure that all accommodations, tickets to Olympic and special events and ground transportation are ready for Coke guests the minute they check in at their hotels.



"Virtually every aspect of this hospitality effort will be supported by microcomputers," according to Bill Conner, Coca-Cola USA's Olympic System manager. "We'll use microcomputers to confirm hotel and ticket reservations, pin down transportation and send individual departments within our company their bills when the Olympics are over."

Expecting to host up to 1,000 guests daily at the summer games, Coca-Cola has booked more than 600 rooms at three major hotels. Five modes of transportation covering 20 different locations have to be scheduled per day. In addition, tickets have to be allocated and distributed for 28 Olympic events, with guests selecting the events of their choice from 350 different meets.

Added to this, dinners, parties and tours to local attractions must also be arranged.

To meet this challenge, Coca-Cola USA last fall formed a three-person Olympic systems team headed by an MIS manager, a systems analyst and a meeting services administrator. After discussing hardware options, the team narrowed down its options to three approaches: to use Coke's mainframe in Atlanta, to buy computer time from a California-based computer service company or to put a computer on-site.

"All three situations would have worked for us. We had problems with every one of them, but we simply weighed our choices against the problems we felt we could deal with most effectively," Conner said. "The ideal situation was to have a computer on-site, and that way it would be completely under our control.

"After evaluating the situation in terms of performance and dollars, we decided that we could design our system around the micros and simply add micros as the systems demand went up."

The evaluation of various software packages led the committee to select Information Builders' PC/Focus because of its versatility, Conner said, and also because many people at the company had previous experience with the mainframe version of the product. But, he added, "data base handling was the main reason why we chose it."

The Olympic System consists of five data bases that will be linked together through PC/Focus' Join facilities when necessary. The data bases cover orders, venues, accommodations and names and addresses. In addition, a transportation data base is being developed for each hotel to produce schedules of Olympic events, departure times, estimated arrival times and travel times.



Coke's 'Kobot' will greet the company's guests when they arrive for the Olympics.



Seated in front of one of the four IBM Personal Computers that will be used by Coca-Cola USA at this summer's Olympic Games are some members of Coke's DP staff.

To maintain, update and query the data around the clock, an IBM Personal Computer will be located at the concierge desk in the Sheraton Grande Hotel, the Coca-Cola USA Olympic headquarters. A second Personal Computer will be located at the ticket exchange window, also located at the hotel, and a third will be located at the hotel's executive offices. A fourth Personal Computer will be available as a backup. Each of the three active Personal Computers will be configured with a 10M-byte hard disk and 768K bytes of random-access memory.

Behind the scenes, an inventory reconciliation will be run nightly based on the data collected on the venue data base. Though no decision has yet been made, the Personal Computers may be physically linked with coaxial cables in a local-area network or they may function as three stand-alone systems.

The Personal Computers will be manned 24 hours a day. Data entry procedures have been designed with Information Builders' Fidel, a Focus screen-oriented data entry language, to produce menu-driven procedures with built-in interactive prompts. To make the system nearly fail-safe, there will be password protection for all critical programs. All programs will be transferred nightly onto floppy diskettes, and purges will be executed to keep the data bases clean and ready for the following day's activities.

In the event that all the Personal Computers are damaged by some accident or disaster, the system can run on a remote Coca-Cola mainframe computer that supports Focus through the PC/Focus Dial communications facility.

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NEWS

Court makes state agency sell computerized list at cost

By Edward Warner
CW Staff

JACKSON, Miss. — A state court in Mississippi has told the state's Department of Public Safety to sell at cost — about $400 — a magnetic tape copy of its computerized mailing list of Mississippi's 1.8 million drivers. The state had wanted to charge the Mississippi Republican Party $85,000 for the list.

The Mississippi Republican Party had offered $500 for the list, which it wants for direct-mail campaigning. When the state turned down its offer, it brought suit.

Mississippi Assistant Attorney General Steve Kirchmayr said the state had previously been charging a rate for the driver's license list close to that charged by private mailing list firms. "Now," he said, "we've got the mailing list companies cursing us for putting them out of business."

Mississippi drivers have been complaining that the state provides the list at all, he said. This is probably because "people don't want to receive any mail, period."

Under the 1983 Mississippi Open Records Act, the list must be made available to anyone who wants to buy it. It includes each driver's name, home address, race, sex and date of birth.

Kirchmayr said the Open Records Act requires the state to provide the information on any of its public record lists for "the actual cost of reproduction."

The state, however, had been pricing the driver's license list based on the wording of an earlier act, which said that it could charge "a proper fee commensurate with the service rendered." That fee, he said, would have been $250, plus five cents per name.

"Our dilemma was which statute controls," he said.

'Bargain basement'

Kirchmayr called the at-cost offering of the list "a basement bargain" and said in the wake of the court ruling, several firms had already inquired about buying their own copies of the driver's license list.

He added that the court decision represents a sizable loss of revenue for the state's treasury, which received the revenue from previous sales of the list made at the going rate. Kirchmayr estimated that copying the list will cost no more than $400, possibly less.

Kirchmayr said that ruling will likely be appealed to the state supreme court, but that no appeal has yet been filed, nor has a copy of the list been produced for the state Republican Party. The list will be run on the party's computers to provide names and addresses for direct-mail campaigns, Mike Allred, general counsel of the Mississippi Republican Party, explained.

The party is particularly interested in cross-referencing the names of the state's drivers with those on the party's list of Mississippi registered voters.

By cross-referencing, the party will be able to single out those individuals who have not registered to vote and appeal to them by mail to do so, Allred said.

Allred does not see the party's purchase of the list as an invasion of privacy issue, because the state's Open Records Act specifies that such lists are public property.

The party, he said, has told the state it does not want the copy of the list it receives to contain any driver's license or Social Security numbers, which would allow cross-referencing with wider data bases.

"The only things we wanted were those things that were open," Allred said.

CAD/CAM guide out

ARLINGTON, Texas — The Office of Continuing Education at the University of Texas here has published a guide for managers who want to use visual aids during presentations about computer-aided design and manufacturing (CAD/CAM).

The 400-page *CAD/CAM Presentation Resource Guide* is a guide containing 8-in. by 11-in. overhead foils, which include topics on CAD/CAM graphics, group technology, computer-aided process planning and manufacturing management systems.

Priced at $125, the guide is available from the Office of Continuing Education, University of Texas at Arlington, Arlington, Texas 76019.

Data base growth covered in supplement

SANTA MONICA, Calif. — The number of on-line data bases worldwide broke the 2,000 mark recently, according to the winter 1984 supplement to the "Directory of Online Databases."

The supplement on data bases noted that 136 data bases came into use in the past three months, bringing the total to 2,014.

The growth in data bases, according to Carlos A. Cuadra, president of Cuadra Associates, Inc., the firm that publishes "Directory of Online Databases," is a result of the spread of personal computers and "the changing economics of electronic distribution," which permit data bases to be started without major financial investments.

The listed data bases are reportedly available from one or more of 300 on-line services worldwide.

The "Directory of Online Databases" is published quarterly.

A one-year subscription to "Directory of Online Databases" is $75, and a two-year subscription is $140.

More information on the directory is available from Cuadra Associates, which is located at Suite 305, 2001 Wilshire Blvd., Santa Monica, Calif. 90403.

DIGEST from page 23

daily routines and who consider themselves as concept strategists and business administrators won't be able to keep their positions in the long run," a spokesman from the study group maintained. Instead, DP managers should take immediate action to confront any problems with branches using microcomputers.

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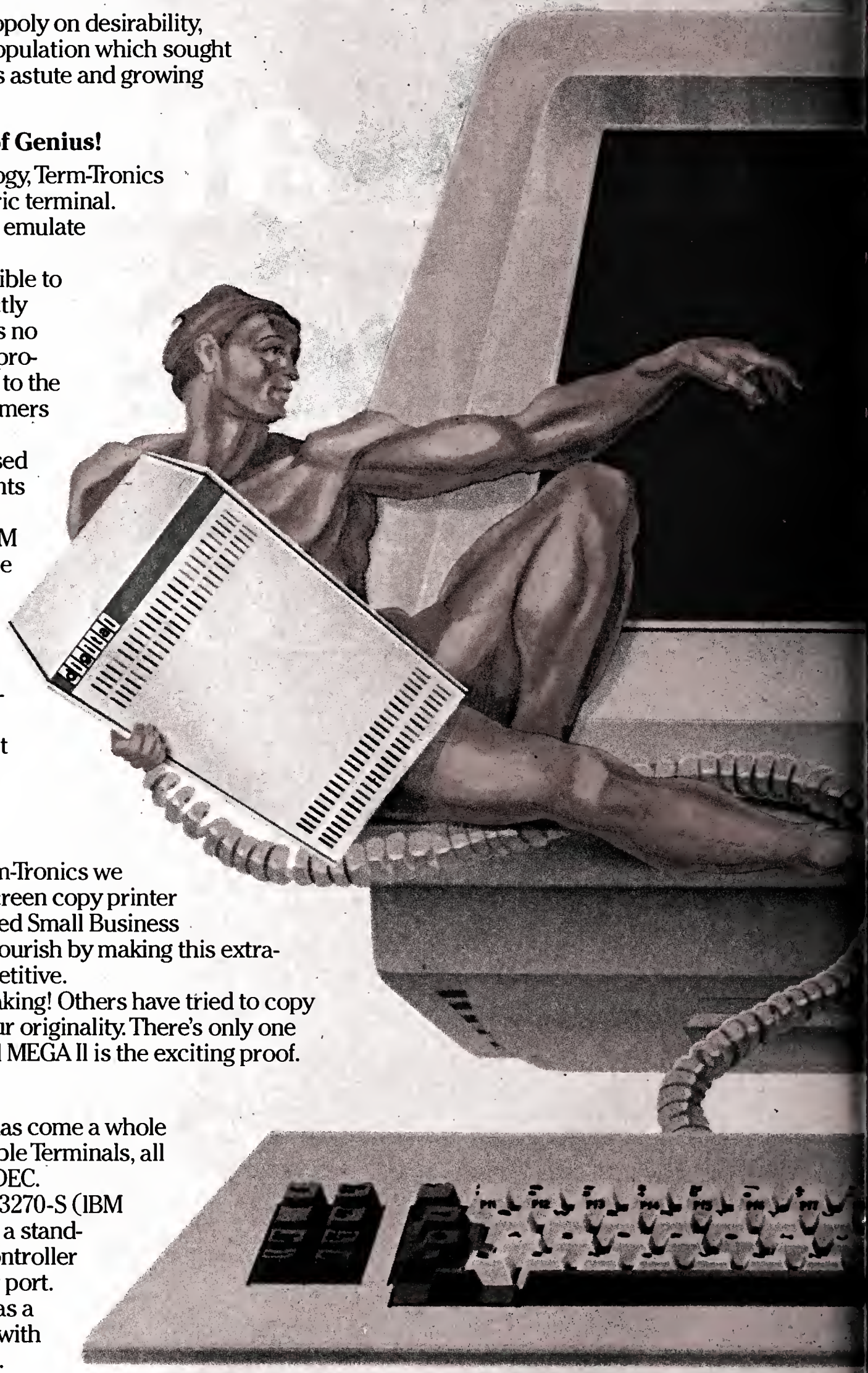
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What's more, MEGA II can be used in either local or remote environments with SNA or BSC communications.

Incredibly, MEGA II emulates IBM 3278 Models 2 through 5 with a single keystroke. The multi-host MEGA II is DEC VT-100* compatible. It also can emulate other asynchronous terminals simply by loading new emulations into the terminal via telephone, and all in 10 minutes or less! Another heavenly advantage is that it requires no additional equipment.



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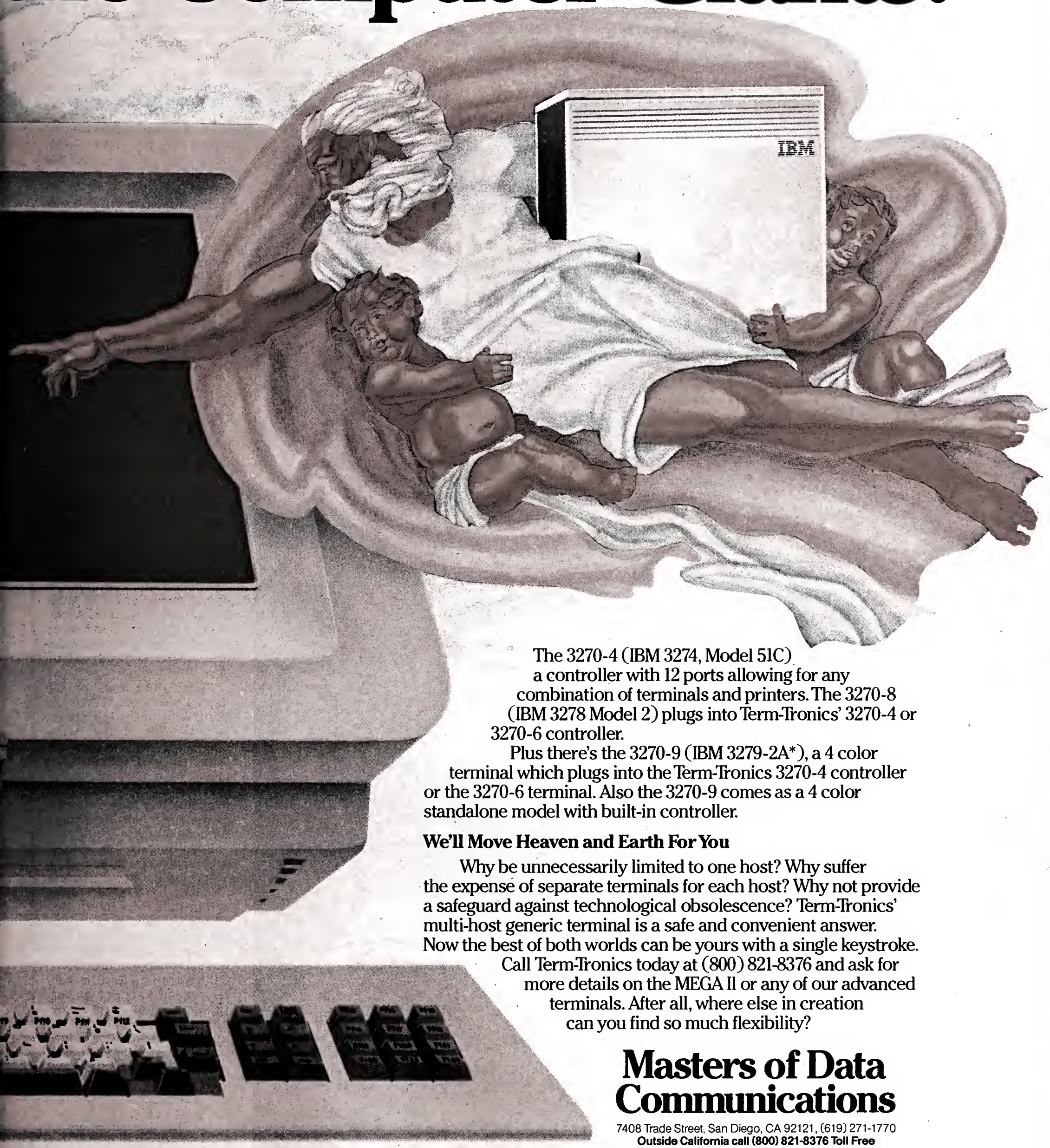
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From the same creative minds has come a whole series of remote BSC mode Compatible Terminals, all of which can be upgraded to talk to DEC.

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NEWS

Meet to look at 'micro wars'

SAN FRANCISCO — The future of the microcomputer industry will be the focus of a conference here May 7-8, sponsored by International Data Corp. (IDC). The conference, titled "Micro Wars: Shape Up or Shake Out," will examine survival strategies for the coming market shakeout and offer predictions of who will be the winners.

Apple Computer, Inc. cofounder Steve Wozniak will deliver the keynote speech and reportedly will discuss the scope of the micro industry in the coming years.

Other speakers will be John Rehfeld, vice-president and general manager of Toshiba America, Inc.'s Information Systems Division, and Aaron Goldberg, research manager of IDC.

Registration for the conference is $695 for the first person from each organization and $595 for each additional person. More information is available from IDC through Box 955, 5 Speen St., Framingham, Mass. 01701.

Software conference seeks new committee members

STATEN ISLAND, N.Y. — The program committee of the Conference on Software Maintenance, to be held Nov. 11-13 in Washington, D.C., is seeking members to propose themes for sessions and other duties.

The Conference on Software Maintenance reportedly will bring together managers, software developers and researchers to discuss solutions to software maintenance problems. It is being sponsored by the Association for Women in Computing, the Data Processing Management Association (DPMA), the DPMA Special Interest Group on Software Engineering and the National Bureau of Standards.

Program committee members will help organize or conduct sessions or activities and, when possible, attend program committee meetings in Washington, D.C.

Those interested in applying for membership on the program committee should write to Nicholas Zvegintzov, 141 St. Marks Place, Staten Island, N.Y. 10301.

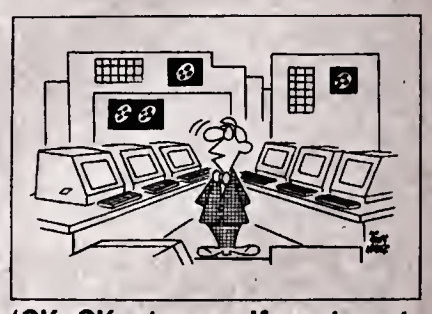
Rep. Zschau to keynote Avois meet

ARLINGTON, Va. — Rep. Ed Zschau, whose district includes much of California's Silicon Valley, will be the keynote speaker at the Voice Input/Output Systems Applications Conference '84, to be held Sept. 11-13 at the Marriott Crystal Gateway Hotel here.

Zschau, chairman of the Republican Task Force on High Technology Initiatives, is a member of the House Committee on Foreign Affairs. He was founder and president of System Industries, Inc., an electronics firm, and has been chairman of the American Electronics Association.

According to the conference sponsor, the American Voice Input/Output Society (Avois), conference topics will include voice interaction with computers in medicine, aid to the disabled, office systems, design, process control and telecommunications.

Registration for the conference is $200 prior to Aug. 19 and $250 after that date. Additional information on the conference can be gained through Avois, P.O. Box 60940, Palo Alto, Calif. 94306.



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Are candid assessments of sales reps appropriate?

TURNAROUND TIME
Larry Long

Q For almost two years, I have been the initial contact person for all hardware vendors that want to sell us their products. By policy, all vendors are routed to me. We are a small company of 300 employees, but I still see six or seven vendors each month.

My job is to assess the compatibility of their products with existing hardware and our standards. Also, I feel some obligation to assess their knowledge of their products and their willingness to work with us toward a solution.

I'm disappointed in some of the sales representatives, especially those selling word processing equipment. They are quick to tell you what others don't have, but can't answer basic questions about the features of their own equipment.

Some ask, "How many do you want?" before assessing our most basic needs. Personally, I don't feel we should do business with these people.

When I inform one of our managers that someone will be calling on them, I usually give them my candid assessment of the sales rep's capability and interest. I do this because at least half of our managers have already been sold a bill of goods and bought hardware without regard to application. Do you feel my extra comments are appropriate?

A Since your company's management has such a bad track record for acquisition decisions, your comments are appropriate and probably appreciated, as long as they can be substantiated with fact and logical rationale.

However, it is not your place to pass judgment on a vendor because of vendor bias or a personality clash. If you continue to provide this bonus information, you should clear it with your boss.

Q I graduated with a computer science degree six months ago and took a job as a programmer. I just received my first performance review; my supervisor told me that I was doing excellent work and learning fast.

While everything seems to be going well on the surface, I may spend several days in front of the tube without coming up for air. I feel isolated and would prefer to do work that involves more personal interaction. I would like to stay in a computer-related career field, but not in programming. Can you suggest other positions that would give me more opportunities to work with people?

A Being a programmer does not necessarily imply the working life of a hermit. Quite the contrary — a programmer's isolation is more often than not self-imposed.

The most effective programmers have frequent interactions with members of their project or maintenance teams. Peer review and user input are integral to successful software development.

By not encouraging interaction with more senior programmers, it's apparent that your supervisor is not giving you proper direction. During the first year of employment, a programmer needs and deserves more guidance. Express your concerns to your supervisor.

Your decision to give up on programming is premature. Given the proper environment, programming offers opportunities for personal interaction and career challenge. I would recommend that you give yourself an opportunity to mature as a programmer (a minimum of two years). Then, armed with a valuable programming background, you can transfer to systems analysis, data base administration or any of a half dozen other computer career fields.

Q I have a degree in physics and am currently working in an online, data base environment as a programmer/analyst. I would like to get a bachelor's degree in computer science, but for family reasons this is not possible.

Is it possible to cover up this deficiency by taking some examinations in the field that are recognized in the employment market? Also, are there any recognized correspondence courses I can take to enhance my career prospects?

A There are no examinations that you can take that will significantly impact your employability. The Certificate in Data Processing and Certificate in Computer Programming, which require examinations, are among the most widely held and best known certifications, but they seldom affect hiring decisions.

I am not aware of any accredited degrees in computer science that can be earned by correspondence. Some trade schools offer correspondence courses but, in my opinion, you would be better off if you take full advantage of on-the-job training and internal education opportunities. Having a computer science or MIS degree provides an easier entree into the computer fields, but these degrees are not prerequisites for career advancement.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*

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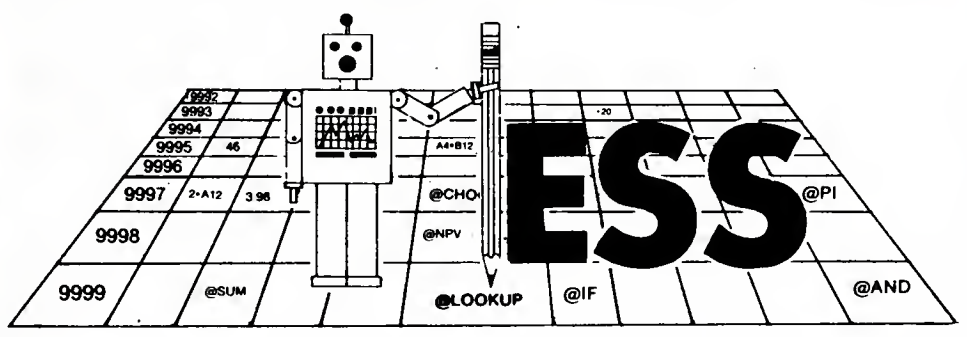
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NEWS

Move over, Michener; store sells only high-tech books

By Jeffry Beeler
CW West Coast Bureau

SUNNYVALE, Calif. — Just as some electronics stores sell only hardware and others deal strictly in software, so Computer Literacy specializes in another valuable commodity: books.

But Computer Literacy is no ordinary bookstore. No tell-all memoirs by fading Hollywood movie queens crowd its display windows. No slick exercise manuals bearing the glossy likeness of Jane Fonda in leg warmers smile down from its shelves. Not even the best-selling tomes of James Michener or James Clavell beckon from the countertops.

As might be expected of a bookstore that sits smack in the middle of the world's densest concentration of high-tech vendors, Computer Literacy carries a highly selective inventory. Each of the estimated 15,000 volumes that form the establishment's current collection focuses on just one subject — computers.

Granted, works like *The Fundamentals of Digital Switching* or *High Output Management* probably lack the wide popular following of Harlequin romances or Mickey Spillane whodunits. Granted, the leaden-titled likes of *Designing Testable Logic Circuits* are probably a far cry from the average reader's idea of a good book to curl up with by the fireplace on a stormy night.

But for Computer Literacy's target audience — MIS professionals and electronics design engineers — such high-tech fare holds a powerful appeal and serves a vital purpose, according to store owner Dan Doernberg. In the fast-paced computer and microelectronics field, the need to keep abreast of the latest technological advances is constant and intense.

"We're not in a leisurely business," Doernberg said. "Companies are constantly telling us that they need additional information to help them develop new products because they're competing with five recent start-ups."

At a time when public interest in personal computing and other electronics matters is running at an all-time high, Computer Literacy is hardly the only bookstore to stock extensive collections of technological literature. But with a selection currently totaling about 5,000 titles, it boasts at least 10 times more electronics-related volumes than its general-interest competitors, Doernberg claimed.

Targeting professionals

Although a handful of other bookstores may rival Doernberg's shop in the size of their computer-oriented collections, few, if any, of the competitors have any in-depth understanding of their products' contents. "Most of the stores that are going into computer books these days are aiming mainly at the consumer market," according to Computer Literacy's manager, Rachel Unkefer. "We, on the other hand, are interested only in serving the needs of technical professionals."

Doernberg agreed. "We're computer-book specialists," he said. "All we do is keep track of computer books. In addition, everyone in our store has a technical background. So when customers have only a general idea of what they're looking for, we can direct them to the right books."

When Computer Literacy first opened its doors for business over a year ago, it restricted its operations mainly to the surrounding Silicon Valley. Since then, however, the store's geographical market has gradually expanded, with the result that approximately 10% of its corporate sales go to customers outside California.

As the scope of the store's business has broadened, its customer base has steadily diversified to include a growing number of MIS professionals, who now account for roughly 35% to 40% of Computer Literacy's total sales.

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CW-138

NEWS

Trio charged with using text system to crack law firm files

By Patricia Keefe
CW Staff

NEW YORK — An unemployed broker and two clerical employees of a prominent New York law firm have been charged with using word processing equipment to break into the law firm's confidential computerized files.

The trio was charged with conspiracy to trade securities following a year-long Securities and Exchange Commission investigation into allegations of insider trading based on the "misappropriation" of confidential, nonpublic information from the law firm of Skadden Arps Slate Meagher & Flom.

Instigated by the firm, the investigation is continuing, according to Assistant U.S. Attorney Andrew Levander, who would not comment on whether further charges are expected in the case.

Charged in the case are two Skadden Arps employees, Alfred Salvatore, a proofreader, and Steven Crow, an "expert computer word processing operator"; and Aaron L. Lerman, formerly employed by Prudential-Bache Securities. Crow allegedly broke electronic internal office codes and stole information on tender offers and corporate acquisition plans and passed that data on to "others," including Lerman, in exchange for a share of the profits gained — in one instance $60,000 — from illegal insider trading, Levander said, but he declined to identify or comment on the number of the others involved.

The scheme is alleged to have taken place over a period of little over a year.

The information concerned several companies that were recently taken over or were involved in a takeover battle, including Puritan Fashions Corp., Houston Natural Gas Corp. and U.S. Industries, Inc., Levander said.

Federal officials claim a fourth person, Steven Karanzalis, a broker with Paine Webber, Inc., traded stocks and options based on the information misappropriated from Skadden Arps.

Karanzalis formerly worked with Lerman at Prudential-Bache, according to the U.S. Attorney's office here.

Although a warrant was obtained to search his home, Karanzalis has not been charged with any offense. However, he is described in court documents as a co-conspirator.

Arraigned two weeks ago, Salvatore and Crow were released on $50,000 personal recognizance bond each, but remain under court supervision.

Lerman was also released on $50,000 personal recognizance bond, posted $500 bond and is under stricter court supervision, Levander said. Attorneys for the trio declined to comment.

ACR issues bibliography

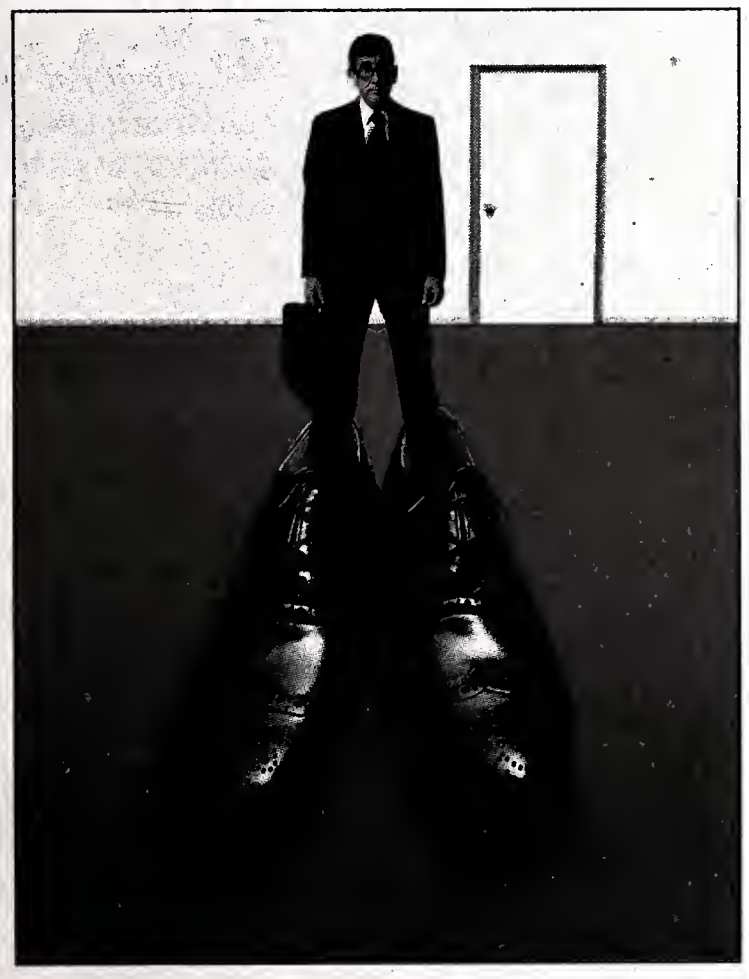
PHOENIX — Applied Computer Research Inc. (ACR), has published its 10th annual bibliography of literature on data processing performance evaluation and management.

The bibliography is contained in the special March issue of the "EDP Performance Review" newsletter. The issue contains more than 500 entries citing literature published in 1983, including periodicals, books, conference reports and government documents.

The bibliography is classified by subject with cross-references and an author index. Each entry contains complete source data.

Copies of the March issue are available to nonsubscribers for $25 each from Applied Computer Research, Inc., P.O. Box 9280, Phoenix, Ariz. 85068.

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Strategic planning urged for implementation of CBT

By Patricia Keefe
CW Staff

CHICAGO — DP trainers who do not plan strategically for the implementation of computer-based training (CBT) will likely lose their ability to control, manage and adapt to this change in companywide instruction.

This warning was issued by Lorraine Shutman, an assistant vice-president at Security Pacific National Bank of Los Angeles at a recent conference here. Shutman, whose responsibilities include administering Security Pacific's CBT system, offered attendees a model for developing a CBT strategy for their company.

Strategy planning provides a framework for the coordination of strategic, administrative and operational plans to accomplish a prescribed aim, she explained.

Navigation course

Shutman reminded her audience that strategy planning is not a tool for overcoming obstacles one by one, but a long-term course of navigation from point A to point Z.

"Strategy planning demands that you think through the social, political, economic and technological factors that may affect your ability to accomplish your mission," Shutman said, breaking down those factors into a series of issue-based questions:

■ *Social.* What must happen so that we may transition our trainees to a new delivery system for training?

■ *Political.* Who owns CBT and how will it be implemented?

■ *Economic.* What is in it for your organization?

■ *Technological.* Is hardware and software available to do what you need done?

Plan for use

After performing needs assessment and data-gathering duties, planners need to develop a plan for use before and during CBT implementation, according to Shutman.

The plan should state the quality and texture of the business — that is, who you will interact with, who the team players and program authors are and what kind of control you will have on authors and quality.

The strategy must push the tactical plan for implementing CBT.

The strategy must also balance the overall scheme. "Is there an organizational need for a delivery vehicle for training?" Shutman asked.

Product superiority must also be addressed, such as how to produce quality training while guaranteeing mastery, productivity and cost-effectiveness.

Perhaps most important of all, Shutman said, the plan must provide the mechanics for an understandable, unified method of presentation and communication — in other words, how to get management to buy in.

In summation, Shutman offered an outline of a five-year strategy for CBT implementation:

■ *Assumptions.* The four factors addressed above.

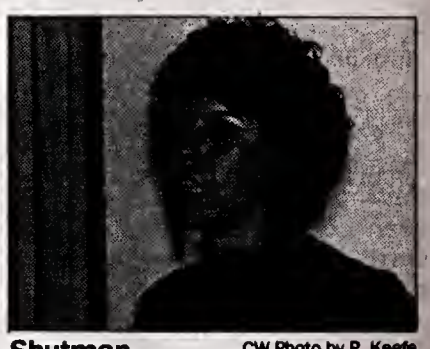
■ *Mission.* The prescribed aim or dream.

■ *Rationale.* What makes your mission viable.

■ *Strengths.* How CBT assists your organization in meeting its goals.

■ *Weaknesses and threats.* What can block your progress to your prescribed aim and what threatens the implementation of CBT at your organization, respectively.

■ *Objective.* What you hope to accomplish within the context of your strategy plan.



Shutman CW Photo by P. Keefe

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5 *Beehive's CC74 is an asynchronous Cluster Controller for BSC or SNA/SDLC 3270 networks. The CC74 can provide emulation for up to eight low-cost Beehive terminals and printers.*

NEWS

CBT planners told micro-mainframe link on the way

By Patricia Keefe
CW Staff

CHICAGO — If you are still agonizing over whether to implement computer-based training (CBT) on microcomputers or mainframes, you could just sit back and wait for integration to come to the rescue.

"Hold your horses and wait for micro-mainframe integration," urged Stephen Sankey, information center manager at the Bank of America, who spoke at a recent conference here. "There's a lot of [system integration] stuff about to be delivered."

Alone, each type of hardware has its drawbacks. Together, as parts of an integrated whole, the benefits of each virtually outweigh those limitations, Sankey said.

However, not all CBT planners can afford to wait for the integration of micros and mainframes to reach their firms, if it ever does.

Formerly manager of CBT at the bank, Sankey gave his audience the benefit of his own deliberations in this area, covering issues of cost, instruction, authoring and administration.

At first glance, it would seem that the firms that do not have a lot of money to spend would do well to turn to micro systems — the hardware, software and backup are relatively cheap, Sankey pointed out.

However, the cost of memory add-ons could prove expensive if the system does not provide hard disk storage.

Moreover, he added, 90% of the cost of CBT is wrapped up in authoring. How expensive the authoring is depends upon the specific needs of the user, not so much the hardware involved. Mainframes allow unlimited course size, easy sharing of data, student dialogue and system backup and recovery, as well as allowing external text to be brought in.

Micros provide ease of authoring in their own way by providing prompts, control over the machine, support of alternative media and elimination of the issue of resource competition, Sankey said.

Technical support

Turning to technical support, Sankey suggested users with limited technical backgrounds might find comfort in a mainframe-based CBT system that allows them to draw on the experience of the systems and mainframe support staff.

Support is not necessarily synonymous with user friendliness, however, and micros win that round with Sankey.

Powerful graphics, ease of use with video, fast response time and portability are some of the "friendly" issues that can raise student motivation, Sankey said.

Mainframes can provide a more powerful CBT system, which is important for users concerned with simulation (prototyping and CBT product support fields) and security issues. Powerful analysis of answers and answer trapping is also available on mainframes.

Administrative issues

Mainframes also seem to have an edge when it comes to administrative issues such as tracking, reporting, scheduling, courseware availability and actual training and support.

Micros are somewhat handicapped by the need for multiple diskettes, which affects the ability to centralize, distribute and schedule courses, according to Sankey.

The mainframe provides extensive data recording, remote distribution, high-volume printers and centralized data.

Moreover, compared with micro-based systems, mainframe-based CBT usually comes with extensive vendor support, a cadre of authors, users groups and CBT classes. Sankey found micros seriously lacking in these areas.

A Better IBM System

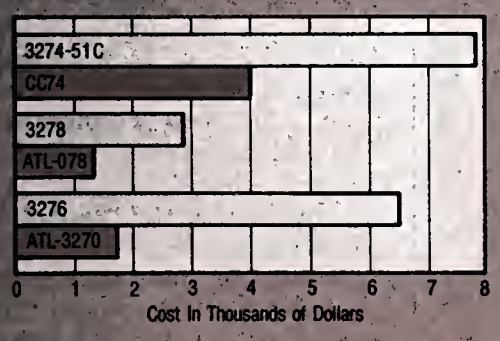
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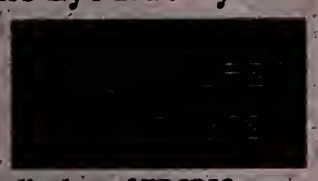
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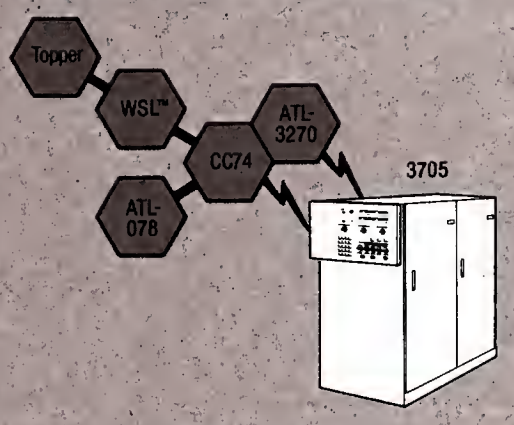


comfort. These features include tilts and swivels; detached, low profile, color-correct DIN Spec keyboard; no fan for noise reduction and of course, the "Eye Fidelity" monitor. Beehive terminals are easy to look at and easy to work with.



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NEWS

More N.Y. hospitals to receive pediatric protocol system

By Lynn Haber
CW Staff

NEW YORK — A pediatric protocol system that serves as an educational tool, aids in resource allocation and monitors patient care will be expanded to serve additional city hospitals here.

The system was first implemented at Kings County Hospital Center in Brooklyn in 1981 and afterwards at the Metropolitan Hospital Center in Manhattan. Implementation of the system at Coney Island Hospital in Brooklyn began last month and will begin at two other as-yet-undisclosed New York municipal hospitals at the end of this year.

The pediatric protocol system was jointly designed for the Municipal Hospital System of New York by the Fund for the City of New York and the New York City Health and Hospitals Corp. to provide two types of information: population and utilization data, which helps supervisory physicians get a perspective on their resources, and data that measures compliance or adherence to a set of pediatric health care guidelines.

Medical protocols are outlines of standard practice for the diagnosis and treatment of given illnesses. "Presently, the system deals with eight common pediatric problems, some of which include upper respiratory infections, sore throat, asthma and urinary tract infection. The guidelines are linked to a structured chart that the doctors fill out," explained Bruce Posner, MIS director for the Pediatric Protocol Project at the Fund for the City of New York. "The information from the chart is coded and entered into the computer, and it is the information on the chart that the computer compares with the guidelines. Reports are then produced which outline, in either aggregate form or on a case-specific basis, adherence to the guidelines."

Supervisory physicians then use the reports to identify a particular issue that may need educational review. "Reports are useful to gauge compliance to the guidelines," Posner said, "but it is understood that in as many as 15% of the cases that the doctor sees, there may be a perfectly valid reason for departing from the guidelines. How the reports are interpreted is crucial."

The same computer system will be used by the additional hospitals to monitor pediatric care. The data processing department uses a 4M-byte Formation, Inc. F4000 processor running in an IBM VM/CMS and VS1 operating environment. Two full-time programmers, in addition to Posner, work on the project.

In its assignment to help city agencies improve productivity, the Fund for the City of New York, established in 1968 with a grant from the Ford Foundation, has additional projects under its belt. These are developed by the fund at the request of different service agencies to optimize or monitor areas that the agencies would otherwise have difficulty monitoring themselves.

For example, the fund recently finished an automated routing system for garbage collection trucks for the New York City Sanitation Department. "Until now, the sanitation department had to produce their routes manually and had no idea if those routes were optimum," Posner said. "Now, they have a computer system which enables them to test many alternative ways of routing and allows them to plug in different parameters so they can test, be more productive and know they're getting optimum routes."

Another computerized system that the fund helped create was a risk assessment system for the Department of Special Services for Children. The system generates reports that help track cases of child abuse and neglect and the allocation of resources.

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NEWS

On-line data base helps bank woo wealthy depositors

Detailed personal information helps attract lucrative business

ATLANTA — The marketing department at a bank here is using an on-line data base as a way of competing with other financial institutions for the highly sought-after business of well-heeled customers.

The First National Bank of Atlanta last year established a new department whose employees use a special data base containing detailed personal information about a select group of customers. "The department was set up to serve the needs of the very affluent customers of the bank," said Margaret Anne Boone, a commercial officer in the bank's marketing department.

With the data base, department employees can quickly access information about the customer — everything from a spouse's name to the name of the country club to which the individual belongs. First National hopes that by providing more personalized service, it will attract more business from those customers.

Rapid information retrieval

"When one of this select group of customers has a request for banking services, our staff can rapidly retrieve a significant amount of information on this customer from the data files," according to Thomas Hills, group vice-president. "In addition, we can search for different types of information by any field of data in the information files."

For competitive purposes, the bank wanted to develop the data base as soon as possible. But the bank's IBM 3081, 3083 and 3033 mainframes were already carrying a heavy work load, and "our programmers were telling us that it would be way down the road before our data base was completed," Boone said.

Bank officials briefly explored other alternatives to expedite the program, such as software packages and a time-sharing service. "We looked at a couple of things that really did not suit our needs," Boone said. The bank finally chose Quality Information Systems, Inc.'s Qtime data base management software.

"[Qtime] was the only thing that was presented to us that really suited our needs," according to Boone. "Their people walked in off the street, literally, and made a presentation. During that presentation, I made the determination that this was what we needed. They did not even know we were looking [for a data base management program]."

The data base resides on a pair of IBM Personal Computer XTs, with one floppy and one hard disk and 512K bytes of memory. The Personal Computer XTs are linked to each other by Orchid Technology, Inc.'s PC Net local-area network, according to Greg Barfield, the bank's DP manager.

Boone said the Qtime program proved to be easy to learn and use. That was an important consideration, she said, in a department where none of the employees — most of whom were part-time workers — had any previous computer background. "I have been able to sit down with the part-time workers, and in an hour they have had the ability to load information and work with it."

Eventually the bank would like to provide a terminal for each of the employees in the marketing department to access the data base. One approach now being examined is replacing the two Personal Computer XTs with six IBM Personal Computers tied by an Ethernet local-area network with a 70M-byte hard disk.

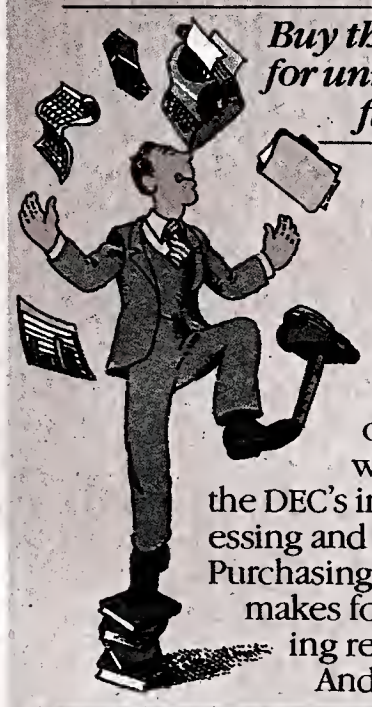
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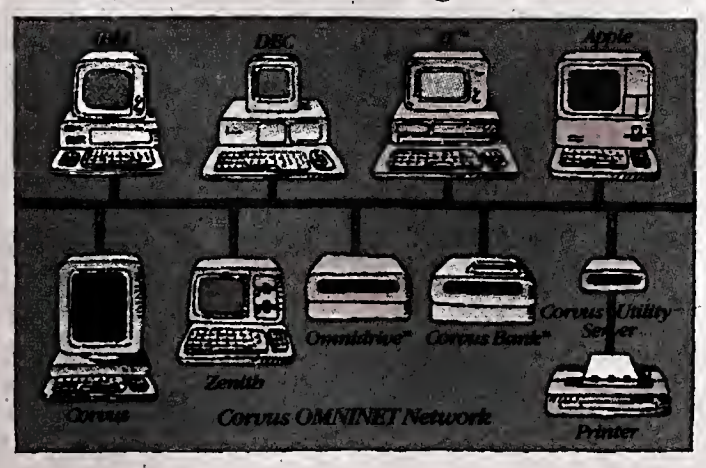


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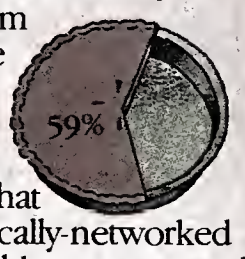
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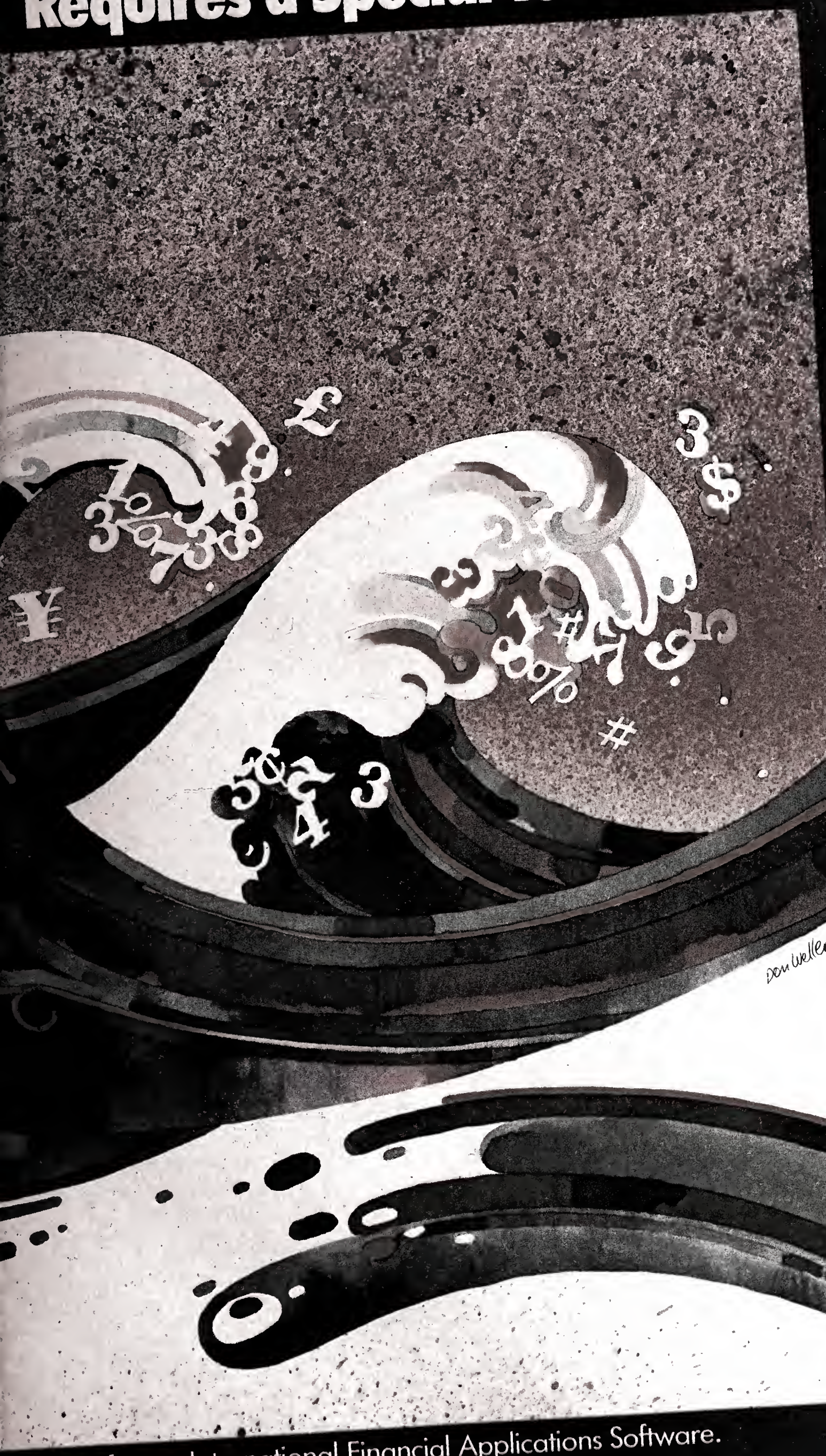
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NEWS

Dema conference/expo slated for Sept. 24-26

STAMFORD, Conn. — The Data Entry Management Association (Dema) has released its 1984 meeting schedule, which includes the Eighth Annual Dema Conference & Equipment Exposition, scheduled for Sept. 24-26 at the New Orleans Sheraton.

Also announced by Dema were three-day professional growth seminars, slated this week, April 11-13, at the Sheraton Hotel in Seattle and April 30-May 2 at the Royal York in Toronto.

The seminars include "Essentials of Data Management," which includes Dema's Certification Program in Data Management; "Increasing Quality & Productivity in Your Data Entry Department"; and "New Directions for Information Management." The seminars each cost $485 for Dema members and $545 for nonmembers.

Dema is an association of information managers involved in both traditional and emerging methods of data entry, including key-to-disk, on-line and distributed processing; voice entry; portable and personal computers; and word processing. Dema can be reached through P.O. Box 16711, Stamford, Conn. 06905.

ABA establishes user groups

CHICAGO — Lawyers who use computers and applications software in their offices can now join several users groups set up by the American Bar Association's (ABA) Section of Economics of Law Practice.

The topic areas of users groups include IBM; Digital Equipment Corp.; Apple Computer, Inc.; Wang Laboratories, Inc.; the Radio Shack TRS-80; time and billing applications; substantive applications; and the CP/M operating system, the group sponsors said.

The groups were set up by the Economics Section's computer committee, which six times a year publishes "Network," a newsletter about computers and their office uses.

Only members of the ABA's Economics Section may join a users group.

Further information is available from Donna Spilis, Economics Section, American Bar Association, 1155 E. 60th St., Chicago, Ill. 60637.

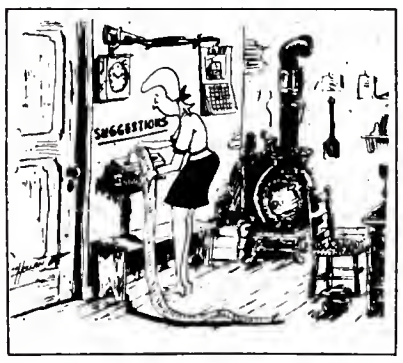
Decision support meet set

NEW YORK — A two-day conference on "Decision Support Software: Personal Computer, Mainframe and Distributed Applications — A Managerial Perspective" is scheduled for May 21-22 here at the New York Hilton.

The conference will discuss end-user computing, distributed decision support, local-area networks, microcomputer policy, fourth-generation languages and artificial intelligence, according to the sponsor, Research and Planning, Inc. of Cambridge, Mass. Scheduled topics include impact of decision support systems on organizations, approaches to evaluating and selecting decision support software and communicating management information.

The conference costs $495.

Research and Planning is located at 215 First St., Cambridge, Mass. 02142.





NEWS

Manufacturing system ousts firm's in-house software

QUINCY, Ill. — After replacing its in-house software with a manufacturing software package, a maker of pumps, compressors and drilling equipment reported that it had increased production by 20%, cut overtime by 18% and eliminated parts shortages.

Headquartered here, the Gardner-Denver Divisions of Cooper Industries, Inc. have manufactured pumps and drilling equipment for mining, metals, energy, compressors for industrial and special applications since 1859. The divisions employ nearly 1,200 skilled workers here and in Sedalia and La Grange, Mo.

In 1979, officials realized that their in-house software running on Burroughs Corp. mainframes didn't meet their needs. They felt the system needed too much manual support, that customer orders had to be scheduled manually and that the system's material requirements planning feature didn't integrate with the existing system.

"There was too much overtime just to meet the orders. We realized the software and hardware we were using didn't meet our business needs. We had to change," said Ken Jones, manager of MIS.

A task force with representatives of various areas in the organization was formed to research the manufacturing software field. It decided in December 1980 to purchase Management Science America, Inc.'s (MSA) Manufacturing System. Jones said one reason for choosing MSA was its implementation approach, with up-front planning and involvement of employees from all areas of the company.

The company bought an IBM 4341 with an IBM OS environment to support the software. Dennis Lipscomb, an analyst in the Sedalia plant, was named project leader for the implementation in the two plants in Quincy and the pilot project in Sedalia.

The Sedalia employees were eager to help. "Gardner-Denver was going to have a class-A system and nothing less. The employees knew that if the plant succeeded, every individual succeeded," said Sedalia plant manager Don Bradley.

Phase I of the implementation began in January 1981, with the division analyzing its business to see how the software would work most effectively. Also, management and MSA provided educational and training opportunities to employees, and Gardner-Denver formalized its operating procedures and controls.

Gardner-Denver then began a cycle-counting program for its inventory. The result was that inventory accuracy rose from 67% to 97%.

The inventory records helped to eliminate parts shortages, Bradley noted. He said that in the past, the final assembly department had required two or three days of notice to expedite parts on the shortage list. With the new system, inventory audits showed that parts shortages were no longer a problem.

"My only argument with MSA was over my shortage list. How would I know what was missing? But then I realized I didn't need one," said Bob Nagel, materials manager. The materials department now can plan its schedule up to a month in advance, giving Gardner-Denver the control it needed to implement the system.

All three plants implemented the first four modules — inventory records, manufacturing, master production scheduling and software control — by November 1982.

With the system, Gardner-Denver can create a master production schedule for employees to follow. Surprises and panic buying have been eliminated, and the purchasing department is no longer ordering parts already in the

See **PUMPS** page42



NEWS

Range of uses found for six-year-old financial system

DALLAS — Six years after installing a financial planning and modeling system for strategic planning, Dresser Industries, Inc. continues to find additional users of the program.

"In the six years that we've had the system, it has become a frequently used tool for anyone who wants to generate reports or manipulate rows and columns of numbers," said Bryant Kershaw, manager of planning systems in the Operations Research Department of Dresser, an energy products and services company here.

At first, the product was primarily used by strategic planners. As enhancements were added to the system, accountants and financial planners began using it. Kershaw estimates that 500 non-DP users around the company perform an average of some 25,000 executions on the system each month.

In 1977, Dresser evaluated a number of financial modeling and planning tools that would help eliminate the tedious work required in strategic planning. After a thorough review process, the company, which has two Amdahl Corp. 470V/8 and two IBM 3033 mainframes, chose CA-Autotab from Computer Associates in Jericho, N.Y.

"We wanted a program that would let planners think about planning," Kershaw said. "With CA-Autotab, they're able to use scenarios and options to find the best product and marketing combination. Doing that manually, especially with a three- or five-year forecast, requires a huge volume of data. The program saves a tremendous amount of time.

"It's especially good for modeling," he added, "because you can use up to 40 'what-if' situations, vary them within each model and still retain your original data." Moreover, "It's so simple that familiarity with computers or programming isn't necessary. . . . CA-Autotab is an English-language system."

In addition to working online, Kershaw noted, CA-Autotab can operate in a batch mode. "Once the model has been established with your rules and formulae, it completes your calculations."

Training for CA-Autotab does not require a great deal of time or effort. "We have trained close to 300 people in the last few years," Kershaw said. "A person becomes productive after only a half of a day of training."

Employees have readily accepted the product. "Anytime you can get a product which allows users to immediately see the benefits in time and money, then that product will go over well," Kershaw said. "I believe CA-Autotab was the first product we used that was truly user-oriented."

PUMPS from page 41

stockroom or sitting on the receiving dock.

"Upgrading our system has upgraded our ability to meet schedules. We don't have that month-end crunch, where everything cascades down to the last four or five days," Jones said.

He reported that the MSA Manufacturing System also has helped Gardner-Denver improve customer service. The company always had a reputation for prompt service, Bradley said, but employees had to work overtime to deliver 97% of its orders on time. Now, the company is provided that reliable service, but has reduced overtime by 18% in the machine shops.

"It was frustrating to have our priorities changed. We spent all our time starting jobs, instead of completing them. Now, we can plan and select jobs requiring the same machines and do those all at one time," Nagel said. "This not only has helped employee morale, but in just 6½ months, we increased our productivity level by almost 20%."

SIX REASONS WHY CINCOM'S MRPS IS THE SUPERIOR SOFTWARE SOLUTION TO YOUR MANUFACTURING CONTROL PROBLEMS.



Paper trader plants custom package to handle deals

NEW YORK — An accounting package is helping a paper trading company here handle its daily operations, while providing the capability to handle future growth.

Perry H. Koplik & Sons, Inc., a privately owned paper trading company here, serves as an agent, broker and trader in wood pulps, secondary fibers, newsprint, liner board and kraft paper. In 1981, it found itself seeking what is now a common goal: computerizing manual operating procedures with an emphasis on improving administrative efficiency.

Although traditional accounting software packages were readily available, the company discovered no one had developed software that could address the main thrust of its particular business needs. According to Edward Stein, Koplik's vice-president and chief financial officer, "Essentially, what we needed was a system that could provide the ability to continue handling an ever-increasing volume of transactions, as well as all the operational functions of the company."

The trade business is a complex one. Traders rarely, if ever, see the product they are handling; their function is to explore the market, bringing together buyers and sellers. A trader's success depends on being able to handle a wide variety of clients and to process volumes of vital data quickly. Accurate and up-to-date trading information is essential in an environment that changes constantly.

Hardware, software issues

Previous to its search for a turnkey system, Koplik & Sons ran invoices, purchase orders and statistics on an IBM 5110 running in batch mode. When it decided to automate a greater portion of the business, it had to consider both hardware and software issues. Although Koplik & Sons looked at other vendors' equipment, it chose Datapoint Corp. because of the "flexibility of its hardware and its growth opportunities," Stein said. For software, Koplik contracted in 1981 with Datamatics Management Services, Inc., which developed a custom system for the paper trader.

The hardware purchased includes 18 Datapoint 8220 data terminals; one 8600 application processor, two 3800 application processors and one 6220 application processor; a 4755 file processor; and two printers — a Model 9257 300 line/min dot matrix printer and a Model 9621 serial printer.

Martin Almquist, consulting director for Datamatics, said, "It is extremely important that the trader have a system that allows him to monitor the entire trading operation continuously, checking availability of goods, negotiating prices and terms and verifying the resulting arrangements."

The Trade Data Expediting (Tradex) system that Datamatics designed for Koplik is able to isolate the different variables of the trading operation and format a support program closely aligned with the actual way the trading business is conducted. Appropriately, it is a system centered around the "route sheet" concept. This sheet, now accessible through the CRT screen, integrates information about all the parties involved in the transaction: the customer, vendor and shipper. Previously, this information was handled manually, which resulted in a lot of paper shuffling that required a lot of time.

"The final result was not just a program, but a solution combining a fully integrated, on-line system to execute and monitor the entire trading business environment," Almquist said.

The Tradex system provides a cohesive operating routine that combines order processing, financial statements and management information reporting. It facili-

See PAPER page 44

MRPS

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4. Modular Growth Path
MRPS is a modular system that provides comprehensive manufacturing control. Virtually every manufacturing need is addressed in one of four planning modules which include: Manufacturing Materials Planning. Master Production Scheduling. Production Planning & Control. And Vendor Analysis & Purchasing. Due to the extreme flexibility of its modular design, MRPS can be tailored to meet specific needs. You can begin with the module, or modules, that address immediate needs. Then, as you grow, MRPS can grow with you.

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NEWS

Colleges' on-line system preps students for job market

RICHMOND, Va. — A group of community colleges here is replacing an obsolete remote job entry terminal system with an interactive on-line system in order to provide students with the best possible preparation for the job market and to facilitate administrative reporting.

The installation of the on-line system is a two-phase project. The first phase, completed approximately six months ago, targets the academic population of the college system. The second phase, scheduled for completion in two years, targets the administration.

The Virginia Community College System (VCCS) is composed of 23 colleges in 33 locations. In the fall quarter of 1983, approximately 6,500 students were enrolled in a two-year data processing curriculum that awards an associate's degree in applied science. Almost 22,000 students were enrolled in some type of DP course.

For DP purposes, VCCS is divided into four regions. Each region has its own IBM 4341 mainframe that serves all the campus computer laboratories and communicates with a host 4341 located here.

Up to 12 IBM controllers communicate with or are locally attached to each regional 4341 — either 3274 controllers with up to 32 ports or 3276 controllers with a capacity of eight ports. The old system's batch terminals with printers are being phased out.

Charles Allen, VCCS' manager of operations and technical support, is coordinating the conversion from batch to on-line. In selecting an on-line system, Allen looked for performance of equipment. The academic network has approximately 600 Telex Computer Products, Inc. 178 and 278 terminals on all four systems. VCCS also purchased approximately 25 T-1800 dual-purpose printers from Printer Systems Corp. of Gaithersburg, Md.

"Having an on-line environment for instruction has exposed students to state-of-the-art methods and equipment," Allen said. "And that's essential preparation for the business world."

According to Allen, the academic network has been operationally sound since completion of installation about six months ago. The 4341, which currently has 12M bytes of memory, is scheduled to be increased to 16M bytes of memory in the near future, Allen said.

A network for administrative purposes will add another 4341 at each region, according to Allen. "We expect all campuses to be doing on-line registration when that system is in place," he said.



Computer Interruptus

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tates the documentation of each step of the trading operation and uses this information to generate the data by which advantageous decisions can be made.

"The Tradex system gives on-line capabilities for operational needs as well as the ability to enter and handle diversified data, Stein said. "It is a viable system that provides management with an effective operational tool that results in better returns on investments."

The Tradex system includes not only routine administrative support programs, but also accounts payable and receivable. An integral part of it is the ability to maintain key variables having the most impact on the trader's profit margin — freight and tariff prices, terms, commission structures and time frames — and to report these activities accurately.

Rather than simply concentrating on accounting, Tradex provided the ability to have an on-line accounts payable, supplier, freight and expense payable system, which was essential to Koplik & Sons.

Package keeps publishers' subscriptions circulating

WHITE PLAINS, N.Y. — If you ever wondered what happened to the latest issue of your magazine or why your subscription was canceled without notice, then you can identify with the problems of publication circulation.

"Logistical headaches in publishing tend to settle in the circulation department," observed Doris Minsker, manager of fufillment services for Knowledge Industry Publications, Inc. based here. Because Knowledge Industry requires accurate subscription lists to *Video User*, which has 18,500 subscribers, and to eight newsletters aimed at markets ranging from book publishing to computer software, the publishing company decided to automate its manual subscription record keeping.

"Previously, we would research customer questions manually," Minsker said. "We could spend a half hour looking for a piece of paper and then send out a duplicate subscription."

The company did not have an up-to-date subscription base. An outside service bureau batch processed subscription data. "We were at least two weeks behind keypunching data," Minsker said. "We had to print mailing labels in advance, or miss mailing deadlines. We never had an accurate picture of our subscription base."

After looking at several packages, the company purchased an $18,000 data management system developed by Vista Computer, Inc. of Elmsford, N.Y. The package runs on a Data General Corp. Eclipse superminicomputer.

The Vista system automatically tracks subscribers' names and addresses, subscription payments and terms. It also issues invoices, payment reminders and renewal notices. "We use the system to flag subscribers close to renewal and mail preprogrammed messages in advance," Minsker said. "It clearly improves our renewal rate."

The system helps to "qualify" the readership by tabulating responses to audit cards and identifying those readers who haven't responded to information requests. This information is vital because a magazine cannot earn income from a subscription until it is verified. The longer a subscription is unfulfilled, the more money the company loses.

"Since we qualify readers more quickly, the package speeds cash flow," Minsker said.

When subscribers now call for information, Minsker can provide accurate answers because the system uses on-line menus and a data base.

Enhancements to the original package create mailing labels and lists used for book promotions and circulation campaigns. Another enhancement produces reports for Audit Bureau of Circulation examinations.

ICCA sets conference

HOUSTON — Interconnections '84, the national conference of the Independent Computer Consultants Association (ICCA), will feature F.G. Rodgers, vice-president of marketing for IBM, and Ken Olson, founder and chief executive officer of Digital Equipment Corp., as speakers.

The conference will be held May 16-19 at the Galleria Marriott Hotel here. The ICCA is an association of approximately 3,000 independent computer consultants which is headquartered in St. Louis.

The registration fee for members is $150 before March 31 and $175 after that date. More information is available from Walter Ulrich Consulting, Suite 450, 2626 S. Loop W., Houston, Texas 77054.

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NEWS

OA system controls gas distributor's delivery, billing

MUSTANG, Okla. — An office automation system has helped one of the largest independent distributors of liquid propane gas in Oklahoma to gain control of its delivery and billing schedule, allowing it to pursue continuing growth.

Bernerd Briscoe started Briscoe's LP Gas Service, Inc. 30 years ago. Today, the enterprise's annual revenues are approaching the $7 million mark. However, Briscoe's son-in-law and general manager, Randy Terrel, remembers that three years ago, booming growth placed management in the paradoxical position of contemplating the very survival of this family-owned enterprise.

Creating a classic case of "too much, too soon," the oil crisis in the mid-1970s proved to be something of a Pyrrhic victory to Briscoe. The sudden interest in drilling for petroleum fired an influx of roustabouts and wildcatter types to the Oklahoma City area. City zoning laws forced new trailer parks and mobile home sites to locate in outlying areas bereft of piped-in natural gas.

As a result, Briscoe's marketing base exploded, until it appeared the company might be getting in over its head. An arbitrarily chosen 21-day or 30-day delivery schedule, fuel deliveries until midnight and a manual billing process that also determined which customers were due for deliveries created havoc at Briscoe.

In addition, a Briscoe subsidiary that handled conversion of vehicles from petroleum to liquid propane was exceeding all expectations. At one time, it had a waiting list of more than 400 cars and trucks.

In the midst of that chaotic success in 1979, Briscoe and Terrel attended an industry trade show, where they heard of Dealers Management Services' Fuel Pak software, which was programmed to run on Wang Laboratories, Inc.'s 2200 MVP computer system. After the show, they began calling other Wang users in the business, as well as users of other computer systems.

The Wang systems already in place received uniformly high grades. "What really made up our minds to go with the Wang system were the reports we heard about the quality of the service," Terrel said. "We figured we could always get a computer and some software to do what we needed, but we wanted to make certain we went with a company that was willing to take us by the hand and lead us into this.

"It was important for us to get the best system we could find with the best backup and service available. In this respect, Wang got better recommendations than all the other computer companies put together."

The system, consisting of a 128K-byte Wang 2200 MVP processor, a 32M-byte fixed disk, a Model 2236 Data Entry terminal, a multiplexer, a printer controller, a 180 char./sec Model 2235 matrix printer, a 53.6M-byte Model 2280-2 fixed disk and four modems, went on-line in August 1980. Initially, Briscoe's office staff voiced some concern about the switch-over from a purely manual system to an automated office system.

"We'd never seen anything like this before, and we knew everything important to the company was on that machine. The feeling was if you pushed the wrong button, everything would be lost for good," Terrel said. "Now everyone is really comfortable with the computer."

The computer handles delivery scheduling by automatically using a degree-days figure to calculate how much fuel each customer is likely to have used the day before. Based on that consumption, delivery tickets are printed a week ahead of time for the drivers. Because the route men have become so much more efficient, the company was spared the expense (estimated at $450,000) of having to buy more trucks and hire extra drivers.

Controlling billing process

The computer system has also aided the billing process. Before the Wang 2200 MVP came on-line, customers who paid late had what amounted to a free ride. "When the Wang system came in," Terrel said, "we had it programmed to add an automatic interest rate of 1.5% per month on balances that are unpaid after 30 days. In no time at all, we found out that the money we were bringing in from the interest payments alone — money we were losing in the past — would more than pay for the cost of the computer in less than a year. It was kind of like getting the computer for free."

Moreover, Briscoe has been able to save almost $35,000 a year in salaries and benefits for site billing clerks by centralizing the billing operation in Mustang. This has also reduced billing errors by at least 75%.

The system has also simplified the process of reporting monthly sales to the state. "We used to have one clerk to figure this out by hand. That's all she would do for two weeks out of every month," Terrel said. "Now we just push a button on the 2200 MVP, and the machine prints out the complete record of all sales. We send the list to the state just the way it comes off the printer."

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NEWS

Mobile terminals, host mini contain fuel firm's costs

SALT LAKE CITY — Mobile terminals in service trucks and a host minicomputer are helping a gas company hold down costs and provide better information to its customers.

Mountain Fuel Supply Co., with more than 220,000 customers throughout Salt Lake County, utilizes its radio-linked network to dispatch servicemen and to provide them with up-to-date information about their accounts.

An IBM Series/1 minicomputer linked to the fuel company's IBM 3081 mainframe can send information to an average of 65 service trucks in the field. That data is received by Motorola, Inc. D-1118A terminals equipped with Motorola VP100 printers installed next to the truck's driver's seat.

"We have IBM emulation on the control unit. The minicomputer talks to the terminals and printers in the field, and they access information off the host as if they were [IBM] 3270 terminals," explained John Child, Mountain Fuel's supervisor of distributed data processing. "We are able to provide the serviceman and the customer with any information that would be provided by a 3270 terminal in the office."

The system gives work orders to the service representative assigned to each neighborhood and monitors assignments to make sure no one is overbooked.

In one day, 4,500 calls

Cold snaps and the day after the first cold night of fall are usually hectic for the Mountain Fuel crews. That first cold night is when many people discover their furnaces' pilot lights are out. One day last winter the crews handled 4,500 calls.

Child reported that Mountain Fuel was the first utility to operate with the full system, with both terminals and printers in all trucks.

Servicemen receive their day's assignments at their area service centers in the morning. Those assignments, as well as emergency calls that come up during the day, are fed into the terminals by the Series/1. With a printout of their assignments, the individual servicemen can arrange their schedules as they see fit.

The system also tells the service representative who made the last service call to the assigned address what was done, when it was done and whether there are any other service calls, such as a disconnect or reconnect order, scheduled.

"Being able to assign servicemen automatically is only part of it. The real value is in being able to get at the customer data base. We have the ability to access information on a real-time basis, which helps the serviceman and also satisfies customers by giving them all of the information that they need from just one company employee. It stops duplication," Child said.

The terminals and the mini provide comparative billing information, with safeguards that bar servicemen from access accounts that aren't assigned to them.

"If while he is out there checking on a gas leak the customer says, 'How come

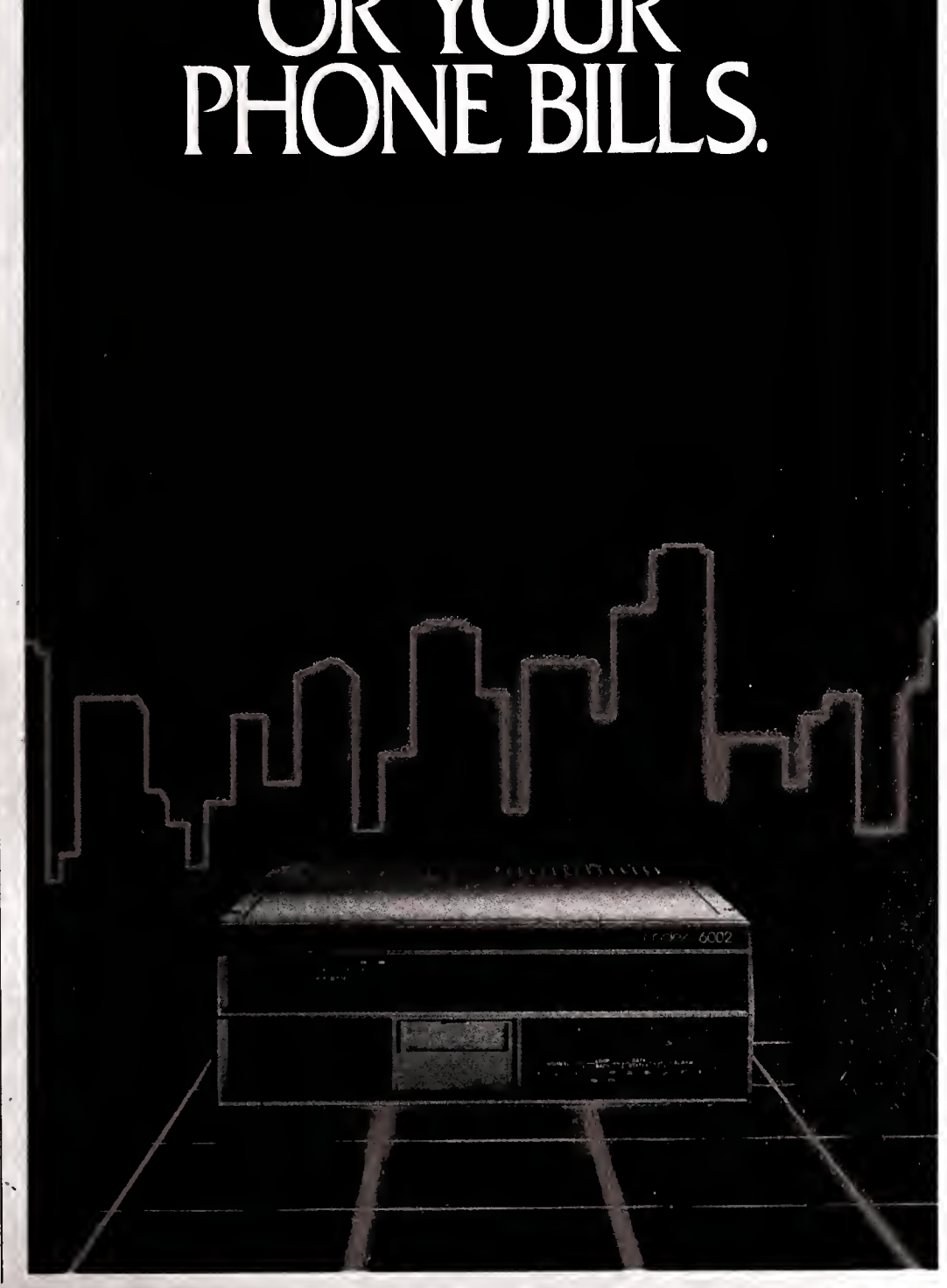
See **FUEL** page 48



A Mountain Fuel Supply Co. representative checks a printout from the mobile printer in his service vehicle to check his next assignment.

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Boscom to open in '85 with international high-tech forum

BOSTON — Boscom, the computer and communications marketplace on this city's renovated Commonwealth Pier, will officially open May 28, 1985, when it hosts the International Congress on Information and Office Management, an event that its organizers predict will bring together an estimated 5,000 professionals from more than 20 domestic and foreign professional associations.

When it becomes fully operational in mid-1985, the one-million-sq-ft Boscom facility will feature permanent showrooms and exhibition space, meeting rooms, videoconferencing facilities, hospitality centers and restaurants, according to a spokesman.

The steering committee for the International Congress on Information and Office Management held a teleconference in January to discuss seminar subjects and guest speakers.

Professional associations that make up the steering committee for the forum include the Administrative Management Society, the American Society of Association Executives, the Association of Legal Administrators, the Data Processing Management Association, the Institute of Administrative Management, the Society of Office Automation Professionals, Geyer-McAllister Publications, Inc. and the National Business Education Association.

Additional information on the office management conference can be obtained from Boscom, which is located at Commonwealth Pier, Boston, Mass. 02210.

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my bill is running twice as much as last year?' the serviceman can look up how much was used and is being used. He might find out that the bill is actually the same, or he might find that it is indeed higher. Then he can suggest what steps the person might take, such as insulating the attic," Child said.

The servicemen typically handle gas service connections and disconnections, gas leaks and emergency safety service on appliances.

As a security precaution, the servicemen logoff the system every time they leave their trucks.

The system has been operating for five years. "When we put it together five years ago, we were about the only ones doing it. I know other companies have tried it since with mixed success," Child added.

Quick payoff

"We figured it would take about four years to pay off. But it actually came in a little sooner." He noted that Mountain Fuel has an advantage over other companies in that it has to contend with no labor unions.

The Series/1, with an IBM EDX operating system and software written by Mountain Fuel's programmers, and the truck-mounted equipment cost $300,000. Child said it costs the company about $7,000 to add the terminal and printer to a truck.

Savings have come from the company's minimizing overtime costs, with the system providing better coordination of calls, and from avoiding increased staffing, as the same number of representatives are handling up to 20% more customers than five years ago.

Child said those service representatives took a "we'll see" attitude when the system was introduced. "Now they won't work without it."

He reported that the previous system required servicemen to radio their dispatchers if they needed service histories for an address and that the dispatcher then had to call up the account on a terminal.

"The system has probably done an even better job than we anticipated when we put it in," he concluded.



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System helps firm keep track of employment records

WILMINGTON, Del. — Invention often is born of necessity. At least that is how the Human Relations Department of Hercules, Inc. developed a cost-effective computer-assisted retrieval system to store and retrieve employment records for its home office personnel.

As part of a major campaign to increase office productivity, Hercules, a chemical manufacturer based here, decided to install communications, energy and word processing equipment in its new headquarters building, four blocks from the firm's old headquarters. As part of the move, which took place last June, management mandated that anyone moving into the new building had to leave his paper files behind.

"We had talked about adopting microfilm for our personnel file for about five years," H. Lloyd Jennings, who was manager of Personnel Information Systems, said. "The relocation to the new building furnished us with the time and place to make the change."

Jennings decided on computer-assisted retrieval. But his file size and volume did not justify the installation of a dedicated mini or even the extra programming necessary to put the microfilm file's index on the company's IBM mainframe.

The only computer equipment available to him was the company's new Wang Laboratories, Inc. VS 100 word processing system. Jennings determined that the Wang system would be suitable for the microfilm index storage; only a little programming was necessary to protect the security of the index and to extract data from the mainframe.

The programming was handled by Jenning's then-assistant, Joan Maloney, and was done in Wang's Glossary language; employee names and Social Security numbers were extracted from the payroll program in the mainframe, saving several days of data entry time. This was done over telephone lines, and the whole process took about a week, Maloney said.

This information became the basic index for personnel files. As documents were microfilmed, their roll- and frame-number addresses were added to the index.

However, because the Wang file was limited to about 120 screens, the index had to be spread out over several files. To locate a particular file, an operator punches in the first letter of the name needed, and the program locates the correct file automatically, Maloney said.

Kodak microfilmer

The choice of the micrographics equipment also was based on need and was narrowed down to Kodak Corp. Because the department receives only 50 to 75 documents a week for filming, a Kodak Starfile RV-3 microfilmer was selected. A more automated microfilmer would have been an expensive extravagance, according to Jennings.

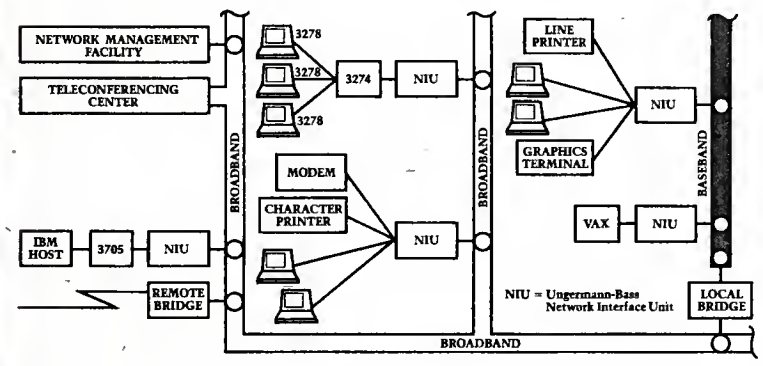
An intelligent Kodak IMT-150 microimage terminal with built-in printing capabilities was installed last fall for retrieval of the document images created by the Starfile RV-3. It is automated for fast retrieval using the roll- and frame-number index stored on the word processing system and can store up to two dozen search requests. Paper copies of the images also are made in the microimage terminal for distribution to requesters.

"We complied with management's mandate by cutting our document storage space from 22 file cabinets occupying 64 square feet of floor space to 23 rolls of microfilm that fit into part of one file drawer," Jennings said. "We also get the advantages of computer-assisted retrieval at a budget price by using equipment that is already available and carefully matching new equipment to our needs."



same time and in the same direction you do. Regardless of the direction that turns out to be.

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AIM announces speakers for May 7 meet

ARLINGTON, Va. — The Associated Information Managers (AIM) has announced speakers to address this year's annual meeting, "Coping With Chaos: Information Management in a Rapidly Changing Environment," which will be held May 7-9 at the Hyatt Regency Crystal City here.

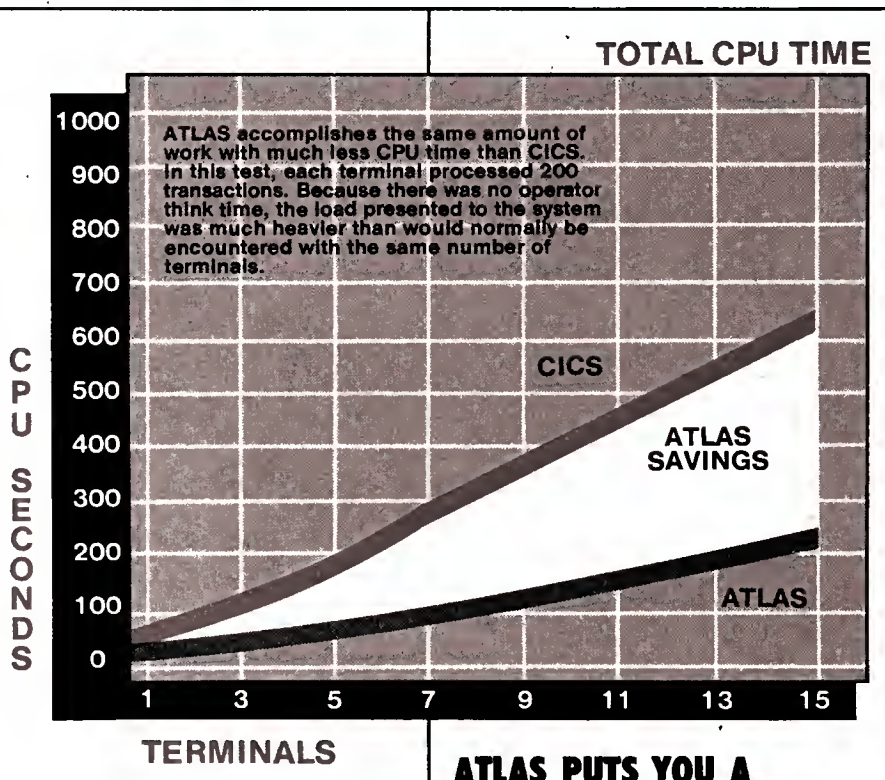
Representatives from the University of Southern California; Peat, Marwick Mitchell & Co.; Handy Associates; Blount, Inc.; King Research, Inc.; Maxima Corp.; American Equipment Lessors; Stauffer Chemical Co.; and Warner-Eddison Associates will speak.

Registration fees for the conference are $325 for members and $425 for nonmembers on or before April 2; registration fees after April 2 are $375 for members and $475 for nonmembers.

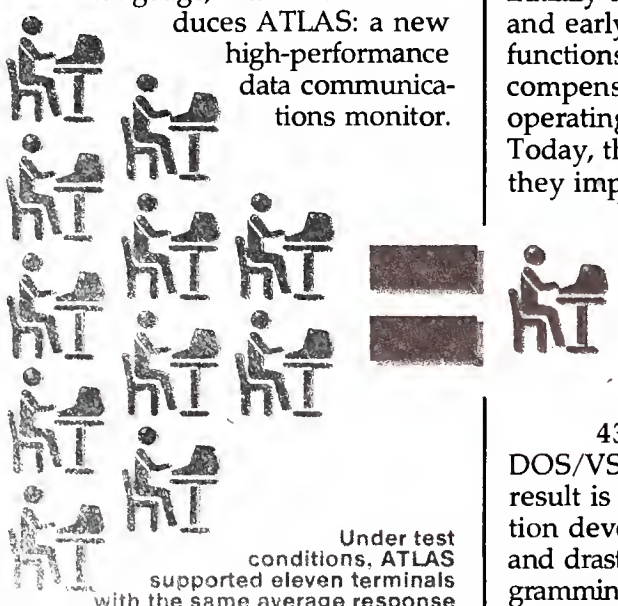
A one-day preconference program called "AIM University" will be held May 7 and will focus on implementing a business plan, managing human resources and information budgeting and evaluation. The fee for AIM University is $75 for members and $100 for nonmembers.

More information is available from Associated Information Managers, Suite 470S, 1776 E. Jefferson St., Rockville, Md. 20770.

IF YOU KNOW RAMIS II, YOU'LL UNDERSTAND WHY ATLAS™ BEATS CICS!



With the same combination of innovative technology and practical features that has made RAMIS II the leading fourth-generation language, Mathematica introduces ATLAS: a new high-performance data communications monitor.



Under test conditions, ATLAS supported eleven terminals with the same average response time as a single terminal under CICS.

CICS/VS is a registered trademark of International Business Machines Corp

ATLAS PUTS YOU A GENERATION AHEAD

ATLAS inaugurates a whole new generation in data communications software. Because CICS and other traditional monitors were initially developed in the late 1960s and early 1970s, they incorporated functions like "pseudo-tasking" to compensate for deficiencies in the operating systems then in use. Today, those functions remain and they impose layers of overhead to burden your computer—unless you use ATLAS.

Designed for the 1980s and beyond, ATLAS is the first monitor to truly unlock the power of IBM's 4300 series computers and DOS/VSE operating system. The result is more productive application development, high reliability, and drastically reduced systems programming demands. But most of all, dramatically improved performance.

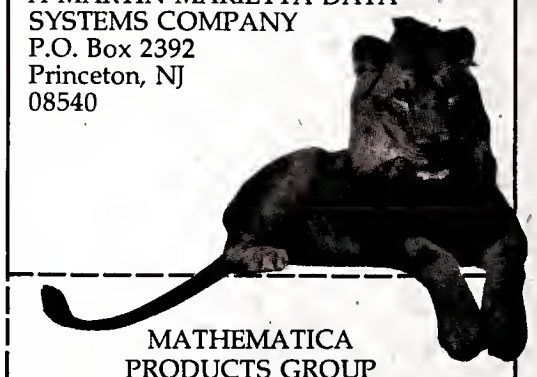
TEST ATLAS YOURSELF

In a recent test, ATLAS outperformed CICS/VS by more than 2 to 1 in both elapsed time and CPU time. And the heavier the load, the better ATLAS performed.

To find out exactly what the next generation in data communications can mean to your organization, try the ATLAS performance test on your computer. Whether you use ATLAS alone or together with RAMIS II, you will be able to support more terminals, improve response time, and get more work done in the rest of your DOS/VSE partitions.

To arrange a free trial or for more information, contact your local Mathematica office, call toll free (800) 257-5171, or return the coupon below.

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Afcom meet scheduled for May 30

LAS VEGAS — "Bridging the Gap Between Computer Operations and Systems Development" will be the topic of the keynote address at the fourth annual operations conference of the Association for Computer Operations Managers (Afcom), which will be held here May 30-June 1.

The keynote address will be given by Edward Roeske, author of *The Data Factory: Data Center Operations and Systems Development.* The conference agenda includes 11 sessions addressing areas of computer operations, such as disaster recovery planning, automated tape library systems and automated documentation.

In addition, according to Afcom, the conference will feature informal discussion groups and a trade show geared to operations concerns.

Registration fees for the fourth annual operations conference, which will be held at the Sahara Hotel, are $580 for Afcom members and $645 for all others.

More information is available from Afcom, which is located at Suite 201, 11501 Brookhurst, Garden Grove, Calif. 92640.

Meet to cover logistics software

WELLESLEY, Mass. — A conference on computer software applications in transportation and logistics management for company managers, software developers and researchers will be held here May 31-June 1 at Babson College.

Conducted by Babson's Office of Sponsored Research, the conference will provide a forum for the business, high-tech and academic communities to exchange ideas on problems related to using logistical software in management decision making.

Scheduled to speak are William McKenna of Ford Motor Co., Robert Camp of Xerox Corp., Yosef Sheffi of MIT and Stella Dafermis of Brown University.

Registration, due May 24, is $250, including meals and program materials.

More information is available from the Director of Sponsored Research, Babson College, Wellesley, Mass. 01257.

What three letters represent the most powerful on-line computer in business today?

TX

The most powerful on-line

Time was, the answer to the previous page was as easy as ABC.

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Today, the world of business computing is being introduced to a system featuring over two-and-a-half times the performance and twice the price/performance of its nearest competitor.

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And most importantly, a system that won't let you down. Because its fault-tolerant design won't let itself down. Even if a major component fails.

This system isn't from IBM.

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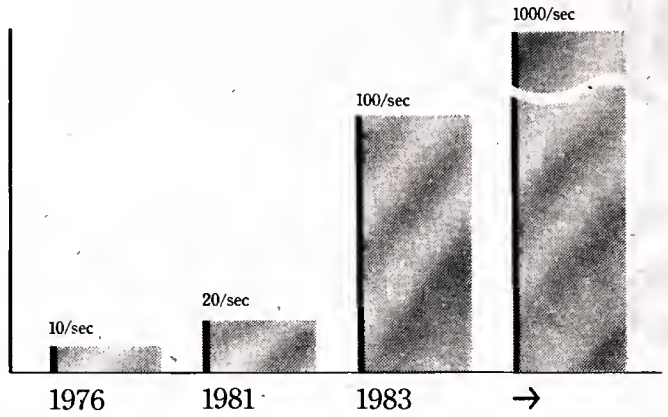
Introducing the NonStop TXP™ system.

TXP: 32-bit transaction processing.

The TXP system processes high volume loads faster and more economically than any other system. Executing over 100 transactions per second now and thousands of transactions in the near future.

It's built around multiple parallel 32-bit processors. Each addressing 16 MB of physical memory and over a gigabyte of virtual memory.

To help memory keep pace with that kind of processing, TXP pulls 64 bits on each memory access.



Our success can be summed up in a second.
Transactions per second. Numbers unsurpassed in the industry. On-line systems that fit your needs today. And tomorrow. With more processing power on the way.

The TXP system also features parallel data paths. Manipulating 32 bits of information in a single cycle, two 16-bit operations in the same cycle.

And TXP incorporates extensive pipelining, to process multiple instructions simultaneously. Each processor overlaps instructions in three levels: Fetching one, while preprocessing a second, while executing a third.

While helping TXP deliver full 32-bit power, for less.

Cache memory pays off in faster response times.

Cache memory is a high-speed data storage area between the processor and main memory. It lets the processor store more frequently used information closer. So it can get to it faster.

And our tests have shown that the TXP cache memory has a 98% "hit rate." Which means the requested data is virtually always nearby for fast access.

The result? Larger volumes of work can be processed in shorter amounts of time. Helping TXP to be even more productive.

Making cache memory pay big dividends.

A system you'll expand, not disband.

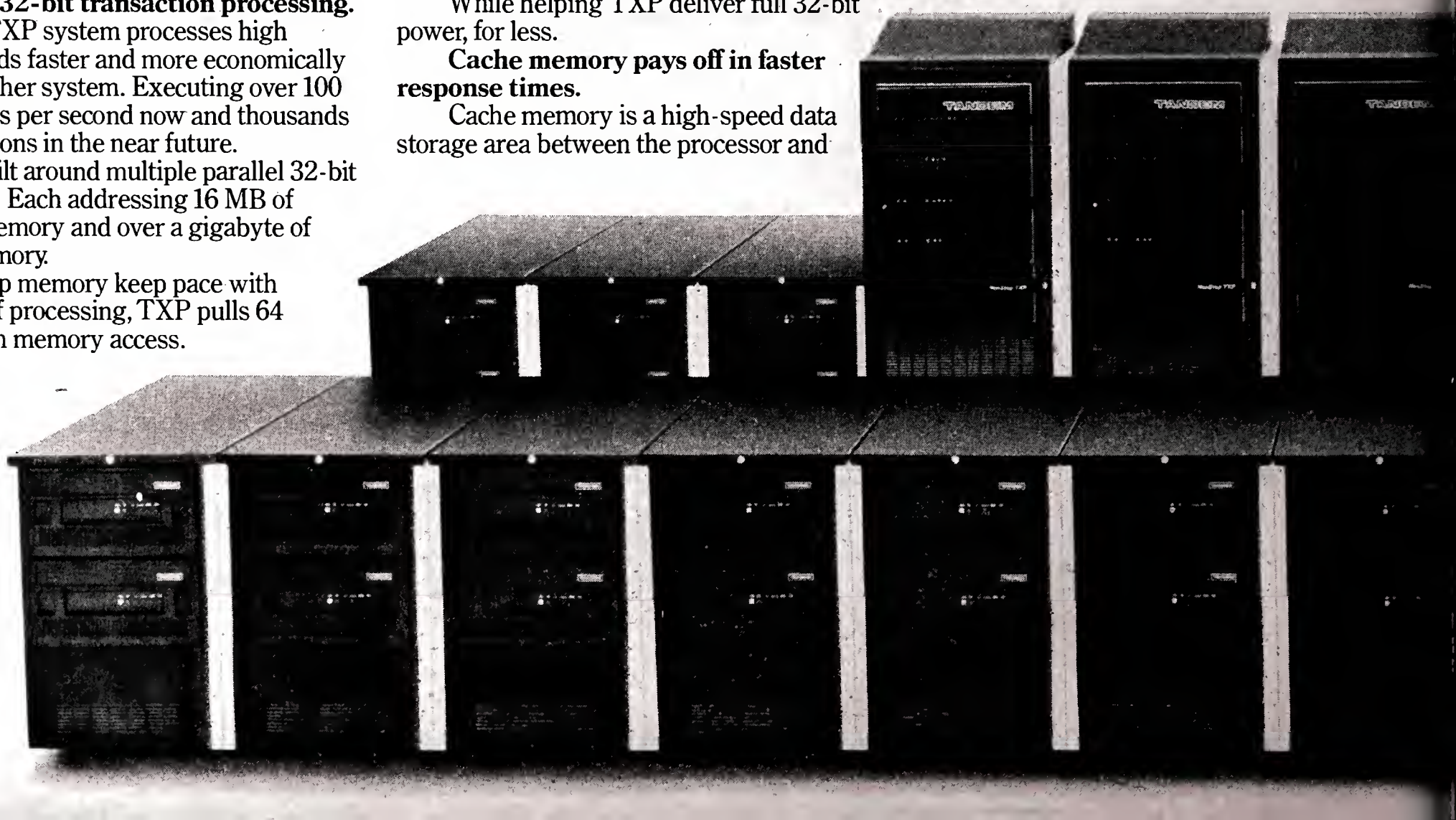
Most computer systems have very limited expandability. So if a company outgrows its computer's capacity, it usually means starting again from scratch.

Selecting and buying a larger and more expensive system.

Then reprogramming.

Then re-training.

Plus all the chaotic disruption and



kP

computer in business today.

massive loss of revenue that's unavoidable during the switch-over.

Not so with the TXP system.

It can expand from two to 16 processors. Increasing its power by a factor of eight.

That's more power than any of the largest mainframes.

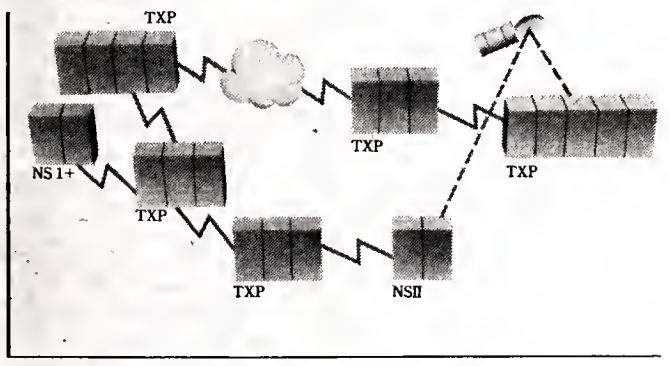
And the additional processors can be installed while TXP is running at full speed. No downtime. No reprogramming.

Still not enough power? Up to 14 TXP systems can be joined together by high-speed fiber optics. Linking the systems together as one computer with 224 processors.

But that still isn't the full potential of the TXP.

TXP systems at up to 255 sites can be joined in a worldwide network. Generating the power of over 4,000 processors.

And that gives TXP the most powerful on-line computer capacity in business.



The most powerful computer network in business today.
Users access a single unified global data base from any of thousands of terminals anywhere in the system.

Expandability our competition wishes they could disband.

NonStop™ system compatibility from the people who started it all.

TXP can process more information and support more programs, users and devices than any other computer designed for on-line transaction processing.

Devices you most likely already have.

Even devices made by IBM.

But what if your company isn't quite ready for the TXP system's awesome power?

We suggest the Tandem NonStop II™ system. The second most powerful on-line computer in business today. The cost effective solution for medium to large corporations.

What if your company is somewhere between a Nonstop II and a TXP?

No problem. They can be combined. They can share the same data and programs. In fact, NonStop II and TXP processors can coexist in the same cabinets.

And what if your company needs even a smaller computer? We make a smaller computer. The Tandem NonStop 1+ system. Perfect for those low-volume sites where less processing power is needed.

Tandem literally wrote the book on NonStop™ transaction processing. That's because we introduced the first NonStop system.

Over eight years ago.

And for over eight straight years, despite attempts by others, we've continued to lead the industry.

Learn all about TXP, ASAP.

For complete literature, contact your local Tandem Sales Office.

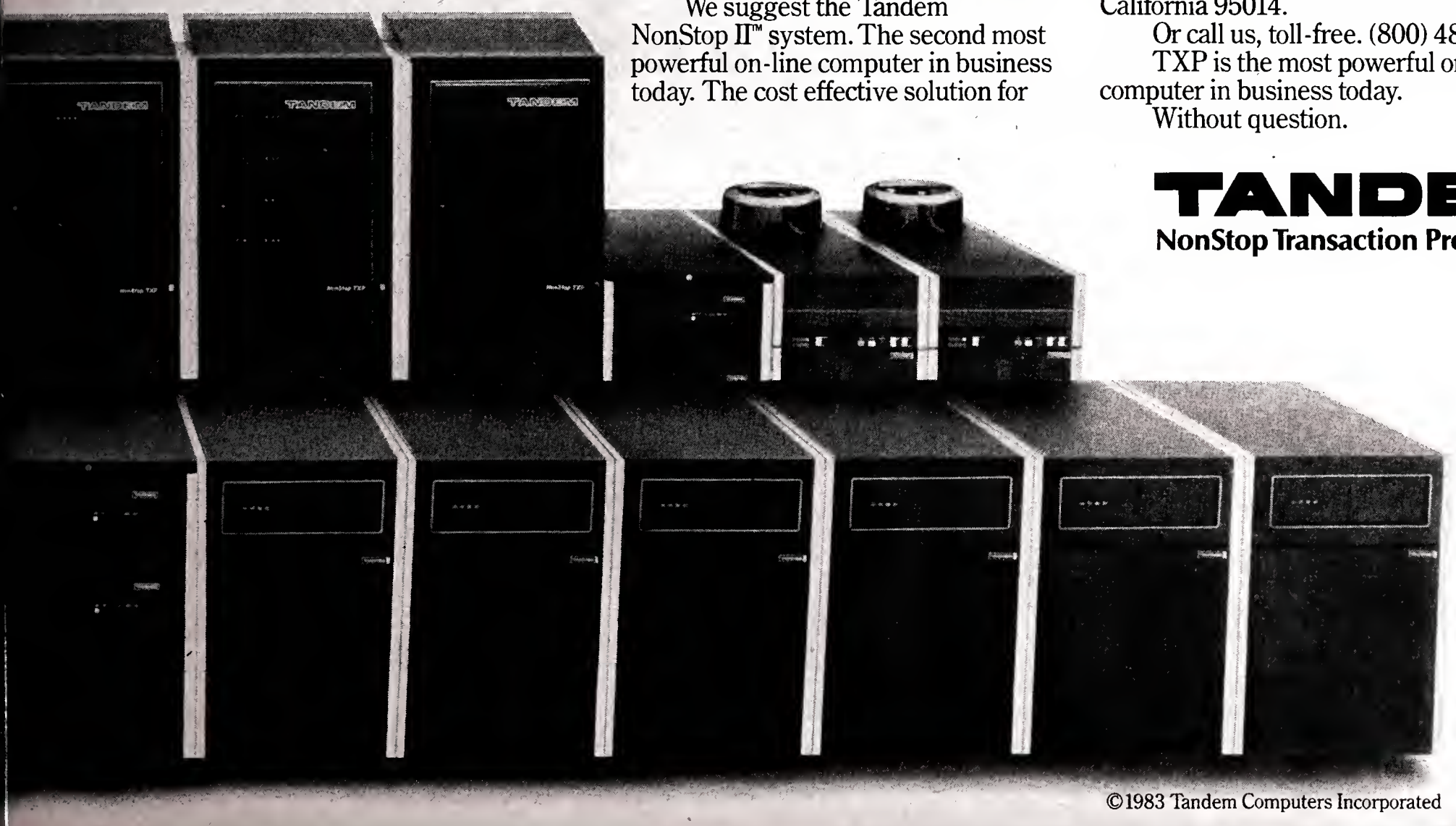
Or write Tandem Computers Incorporated, 19333 Vallco Parkway, Cupertino, California 95014.

Or call us, toll-free. (800) 482-6336.

TXP is the most powerful on-line computer in business today.

Without question.

TANDEM
NonStop Transaction Processing



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Anatomy of an automation

Committee picks manufacturing control system

KENSINGTON, Conn. — You are a small manufacturer of large machine tools who is still scheduling and controlling manufacturing with pencil-and-paper methods. You know you need to automate your administrative systems. In order to improve the work flow through the factory, you are going to have to shorten lead times, reduce inventories and eliminate costly last-minute shortages.

The bottom line: You know you must install an electronic production control system right now.

But with the proliferation of minicomputers, microcomputers and mainframes, where do you turn?

To the uninitiated, the babble of bits and bytes is a language of confusion. But it is all part of the problem that faced Donald T. Benson, president of Goss & DeLeeuw Machine Co. here. Like any good executive, his solution was to form a committee, but this time the committee was different.

The committee consisted of only two people: John R. Abell, special assistant to the president and assistant secretary, and Ronald E. Kerner, a Goss & DeLeeuw toolmaker whose hobby was computers. Abell, who had 35 years' experience with the company, knew administrative requirements and manufacturing procedures intimately, and Kerner, who, while pursing his degree, had studied computer design and programming for 10 years and had built his own computer, provided the electronics background.

That balance of company experience and computer knowledge was complemented by the fact that two people working together, answering directly to the president, can accomplish more than a large group that is groping for leadership. The two have since become the company's data processing department, with Kerner moving from shop to office as DP coordinator.

"We were primarily looking for a manufacturing system. We didn't want to do any accounting at the outset," Kerner said. "We wanted a packaged, on-line, real-time interactive system that could be adapted to our company without too many changes. So while hardware was important to our decision, software was the determining factor."

One other factor was important. The two-man committee specified that both software and hardware be provided by the same vendor in order to keep the in-house DP group to a minimum. The committee recommended that the company should be willing to alter its forms and procedures to utilize the software in its present form, thereby minimizing the requirements for programmers.

Kerner drew up a flowchart showing the company's needs, and four of the 12 vendors with whom he and Abell talked had systems that could meet those needs with their own applications programs.

They determined that NCR Corp.'s Interactive Manufacturing Control System II (IMCS II) most closely fit the company's requirements. The NCR representative recommended that it be run on an NCR 8410 computer, which was the smallest and least costly of the 8400 series of computers. However, as Goss & DeLeeuw's computing needs increased, the 8410 could be upgraded with more memory and speed by adding circuit boards. Changes in the computer would be transparent to the programming.

Once the computer system was installed, the first activity was to build an inventory of all parts in stock, including data on cost, selling price and numbers, with about 7,000 active parts in stockroom inventory and several thousand in general plant inventory.

"Many of our field people knew parts by their existing numbers, so we wanted to keep them the same if possible," Abell said. "It was simple to adapt our existing part numbering system to the data processing system. We just picked them up, adding zeroes where necessary to fill them out to the five digits our program requires."

Completion of the item master file had an immediate effect on the customer service department. "We need to know parts availabilities and prices to answer the questions," said Pete Steffick, customer service manager. "When we used to get a telephone inquiry, we would run to the stockroom to check on immediate parts availability, then to the front office to

See NEEDS page 56



One of seven computer terminals on the system operated by Goss & DeLeeuw is located in the parts stockroom. The stockroom cycle counts active inventory. The most recent physical count was 99.4% accurate with the inventory report.

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NEEDS from page 54

check prices. This all happened while the customer waited on the phone. One thing about it — all of that running around kept us in good physical shape."

Now that the inventory is available through a computer terminal on his desk, Steffick can be keying in parts numbers while he is talking to the customer. When the request is entered, the screen shows parts availabilities and prices, and Steffick can answer the customer's questions immediately.

"It saves a lot of time and effort and eliminates errors in pricing," he said. "If the system goes down, I have to go back to the old way, and I don't want to do that."

Next to go on the system were bills of materials.

"This is the critical cornerstone in our manufacturing system," Kerner said. "However, it's been a slow process getting the data base entered. Before we can enter any bill of materials, we need to clean it up — making sure all of the parts numbers are correct and all bills are properly structured and modularized."

A major problem is that almost every Goss & DeLeeuw machine is built to customer specifications; thus, almost every machine is custom designed. That means a great number of bills of materials — each with its own slight difference from the others — has to be checked and entered.

As the bills of materials are completed, the parts numbers are cross-indexed by the computer to compile a where-used listing. Now, engineers can cross-reference any parts number at any time. If the configuration of a part on any bill of materials should be changed, the engineering department can immediately check all other bills of materials in which that part is used to determine how the change affects the entire line of products. All of this information is available either on the terminal screen or on a paper printout.

Data on all of the items in the inventory and bills of materials can be retrieved by parts number. However, Kerner also has developed programming to retrieve the data by generic key words, using a natural-language program.

Automation of bills of materials has speeded machine specification for the engineering department, Kerner noted. It formerly took about one-half day to find and check out the bill of materials for a new machine order. Now, it takes 15 minutes.

Order processing, one of the earliest IMCS II modules to be installed, has been adapted to two different types of orders: parts orders, which are handled by the customer service department, and machine orders, usually handled by the office of the president.

Parts orders, when keyed into the computer, are sent to the stockroom computer terminal. When the parts are picked and packed, an acknowledgment is sent to the computer, which then prints shipping documents and labels. The day after shipment is made, the computer prints the invoices.

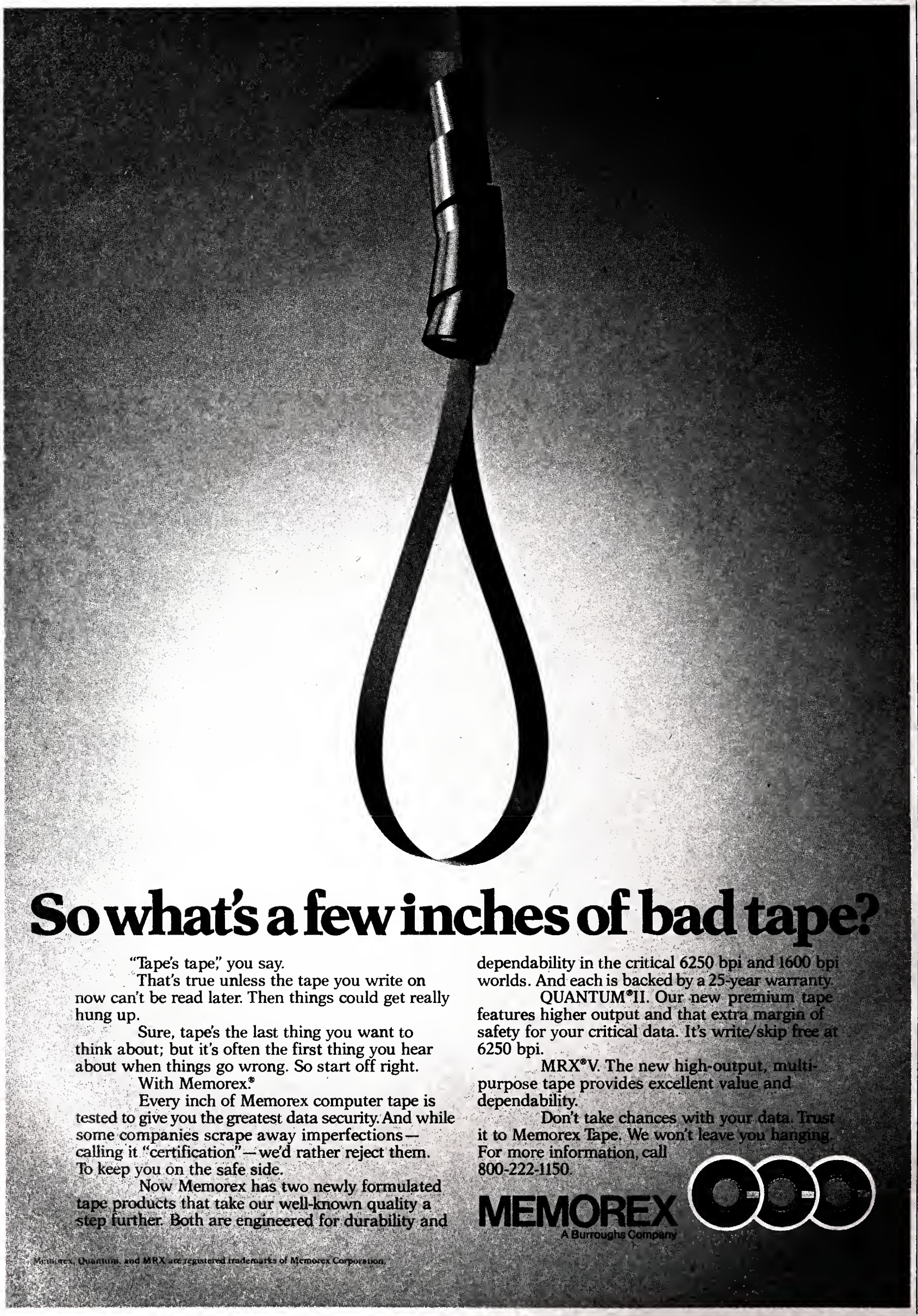
Time savings

"Because it's so automatic, the order processing program has saved huge amounts of time," Abell said. "With partial shipments, we used to type the information eight or nine times. Now, we only enter it once and let the computer do the rest."

New machine orders are configured directly from the customer's purchase order onto a computer-prepared machine specification sheet. This becomes the bill of materials for that specific customer's machine. A shop order is generated from which the computer will order parts, prepare pick lists, issue shortage lists, prepare shop orders and eventually ship and bill.

"To date, we only have three of the seven modules of IMCS II up and running," Kerner said. "Our slowdown was caused by our own need to correct and update all bills of materials."

Five terminals were originally installed for the computer system: a master terminal in the DP department, a second unit shared by customer service and engineering, a third terminal in the order entry department, a fourth in the factory production control department and the fifth unit in the stockroom. Since then, two more terminals have been added.



NEWS

Manufacturing system helps firm control growth

STOUGHTON, Mass. — Vanzetti Systems, Inc., a Mass.-based high-technology firm, last fall shipped its first $200,000 laser inspector to Texas Instruments, Inc., where it is used to identify and repair solder defects in printed-circuit boards. The shipment represented years of product development for the growing firm, and the investment is already paying dividends — Vanzetti's sales went from $1.7 million in 1982 to $2.6 million last year.

The company added 15 employees in 1983 and now has a payroll of 75. As much as these numbers indicate a positive future for the company, they foreshadow a problem common to rapidly expanding firms: Could Vanzetti's managers control this growth?

The 15-year-old firm, located here in a 25,000-sq-ft plant, anticipated this need well in advance, and early in 1983, Vanzetti hired a financial analyst to choose a computerized control system for both production and accounting requirements.

The manual reporting procedures then in use were slowing down manufacture and sale of the company's industrial temperature control devices, as well as its Laser/Inspect product, a combined laser and infrared detector that eliminates visual inspection of printed-circuit boards. Vanzetti incorporates state-of-the-art infrared radiation, fiber-optic and laser technologies to manufacture these electronic controls, which range in price from $3,000 to over $200,000.

Increase efficiency

Michael Dostoomian joined Vanzetti a year ago as financial analyst and systems manager with specific instructions to select a computer system that would increase the efficiency of the company's manufacturing and financial reporting operations.

After a selection process that began last fall with 14 firms, Vanzetti selected the FM/3000 productivity system developed by Computer Solutions, Inc. of Burlington, Mass.

The financial, manufacturing and inventory control system combines Hewlett-Packard Co. HP 3000 minicomputers with Computer Solutions-developed productivity software.

Vanzetti expects complete pay back of the $110,000 system in less than three years. "Previously, we were facing an eventual increase in our staff of at least four people at an annual cost of $60,000," he said. Dostoomian estimates that within a year two employees would have been added to the accounting department, another salesman and another person for inventory control.

He decided the best approach to automating Vanzetti's production and accounting procedures was to coordinate a number of the company's operations. He reviewed each department's needs, developed a request for proposal addressing those needs and then held a tour for vendors.

Vendors submitted responses to a series of yes or no questions from each department as to whether a particular service could be provided. After reviewing the 14 proposals with various department heads, they narrowed down the list of vendors to three finalists. Before making a final decision, Vanzetti officials visited a number of sites where the three systems were in use.

The software programs of FM/3000 are menu-driven and include financial and manufacturing functions, such as general ledger, accounts payable, accounts receivable, materials requirements planning and inventory control.

Noting the company's expansion of on-hand and on-order inventory, Dostoomian said control of parts inventory for the company's products is critical to on-time client delivery.

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NEWS

PBX seminar set for May 2-3

NEW YORK — A two-day seminar on "Office PBXs: Crucial User Issues in Voice and Data Integration" will be held May 2-3 at the Plaza Hotel here by Probe Research, Inc.

The seminar will focus on communications standards, wiring the facility, shared tenant services and influence on industry structure.

The seminar registration fee is $795 for each attendee and $695 for each additional registrant from the same organization.

More information is available from Probe Research, Box 590, Morristown, N.J. 07960.

OA users' views topic of Syntopican XII

Scheduled for July 17-21 at Chicago's McCormick Place

CHICAGO — User viewpoints on office automation will be the focus of the Syntopican XII conference, which will be held at McCormick Place here July 17-21.

The conference, which is sponsored by the Association of Information Systems Professionals (Aisp), will have as its theme "Communicating Information: People, Systems, Networks."

According to the sponsor of the conference, the conference is designed to give attendees a closer look at the theory and practice of office automation.

During the "User Applications and Perspectives" session, Henry C. Ancona, manager of office and information systems marketing for Digital Equipment Corp., will speak on "The Payoff in OA and Personal Computing."

Ed Odisho, a senior systems analyst for the National Aeronautics and Space Administration, will moderate a panel on "Implementing Integrated Office Information Systems" at the conference.

In addition to this, a forum titled "Realizing Automation: User Views on Vendor Integration" will be moderated by Jean Green Dorsey, deputy director of MIS for the city of New York.

Three case studies in systems communications and compatibility will be presented at the Aisp-sponsored conference by Carolyn Giovannini, director of office automation for the New Jersey State Department of Community Affairs.

Registration fees for Syntopican XII are $275 for Aisp members and $350 for others.

Aisp Conference Services is located at 1015 N. York Road, Willow Grove, Pa. 19090.

Graphics group seeks students to help at meet

ANAHEIM, Calif. — The National Computer Graphics Association is looking for student volunteers for its annual conference, which will be held at the Anaheim Convention Center here May 13-17.

Volunteers are needed to answer phones, assist registrants, monitor sessions, deliver messages and assist with light clerical work. In return, the organization offers benefits packages that may include, depending on the amount of work performed, free registration to tutorials and technical sessions and admission to the exhibition.

More information is available from the National Computer Graphics Association, Suite 601, 8401 Arlington Blvd., Fairfax, Va. 22031.

AI symposium to begin Aug. 6 at university

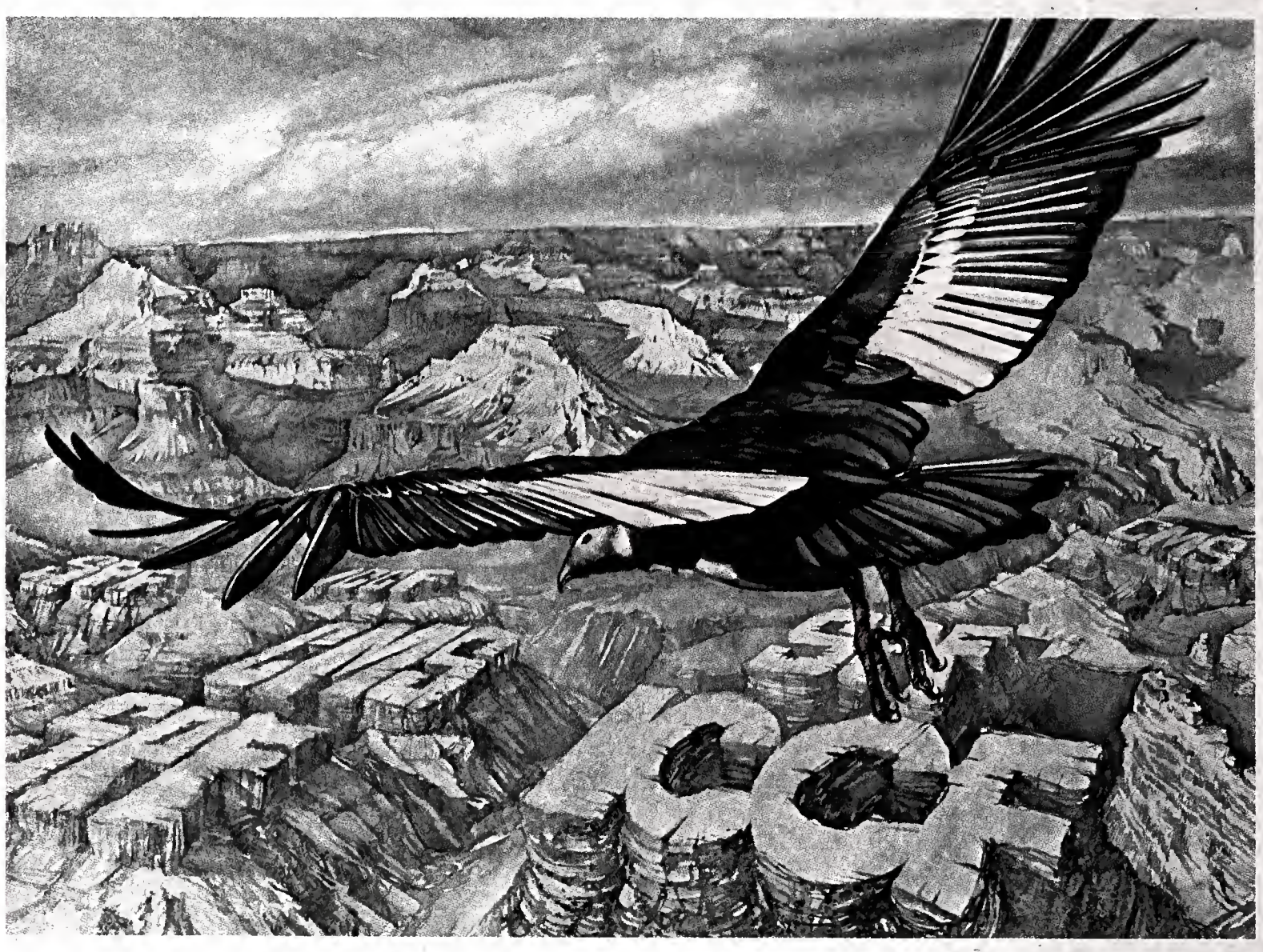
AUSTIN, Texas — Artificial intelligence will be the subject of a national conference to be held here Aug. 6-10 at the University of Texas by the American Association for Artificial Intelligence (AAAI) and the university's departments of mathematics and computer sciences.

The conference will feature seminars, exhibits and panel discussions to examine the latest developments in the field.

Sessions on social, philosophical and economic issues influencing artificial intelligence in the U.S. and abroad will also be offered at the conference.

Prior to June 18, conference registration fees are $100 for AAAI members, $140 for nonmembers. Prior to July 18, registration fees are $130 for members and $165 for nonmembers.

Further information is available from AAAI, which is located at 445 Burgess Drive, Menlo Park, Calif. 94025.



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CONDOR

Radar parts builder goes on-line to track shop floor

EL SEGUNDO, Calif. — A Hughes Aircraft Co. radar parts manufacturing division here found it needed something better than radar to keep track of its parts.

Hughes' Radar Systems Group's manufacturing division turned to an on-line shop floor control system based on a Tandem Computers, Inc. Non Stop II system with Epic Computer Products, Inc. Data Collection Equipment terminals and controllers to provide information about each manufacturing part to be used in the production of radar systems for the U.S. armed forces F-14, F-15 and F-18 jet fighters.

The considerable task of integrating the Tandem system into the Epic data collection front end and IBM IMS data base manager was accomplished relatively quickly, according to Kenneth Dalgleish, head of user training in publications and development.

Dalgleish noted that a complete Cobol rewrite of some existing software and much new software was required to enable the Tandem system to transfer data between the shop floor and the IMS system on the existing IBM mainframe. Despite the size of the job, the Tandem Non Stop II system, with 8M bytes of main memory and 900M bytes on disk, was installed in November 1982 and was operational two months later.

Nonstop service

Dalgleish said that the automated shop floor control system is in service seven days a week, 24 hours a day, making the fault tolerance of the Tandem Non Stop architecture a critical feature of the data collection operation.

Hughes Aircraft's shop floor control system is used for several data collection applications to improve scheduling and manufacturing control. It also provides cumulative data needed for strategic planning on the IMS system in the Radar Systems Group's manufacturing division.

Dispatchers and assembly line workers can track the location of all parts throughout the factory, while managers use the data on a cumulative basis for weekly planning reports. Because information about every part in the manufacturing process — from the time a part is ordered to the time it leaves the shop — is now constantly available to shop floor people, managers are better able to prevent the production of defective parts.

By improving the shop floor control program through increased knowledge of each part, either on the assembly line or in the fabrication process, managers also can improve the company's material requirements planning (MRP) to monitor and control the manufacturing process.

Operators who need to move parts — antennas, receivers, transmitters, power supplies or programmable computers — through the radar system production line press a function key on their terminals to access an assembly mode. Employees enter their names and the identification numbers of the parts to be moved within the factory. Using Epic's bar code wand reader, they can scan a menu of specific factory assembly locations. Information is transferred to the terminal, and the operator then physically moves the part to the desired location.

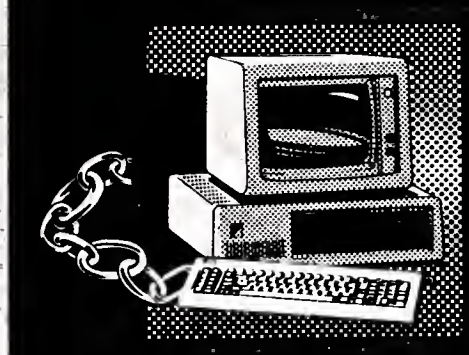
Assembly workers and dispatchers can input data into any of 90 terminals on the shop floor and then send this data through communications lines to a system control unit, which formats the transactions and forwards them to the Tandem system. The shop floor control system tracks the location of all tools on loan to the shop floor from the central warehouse. It also monitors employees' hours by scanning badges.

Because most contracts for producing radar systems are negotiated with the federal government, Hughes must record accurate information on itemized labor costs for hourly employees. Within a five-year period, the Radar Systems Group expects to integrate a network of 900 terminals to improve monitoring, quality control testing and any necessary rework to manufactured parts, Dalgleish said.

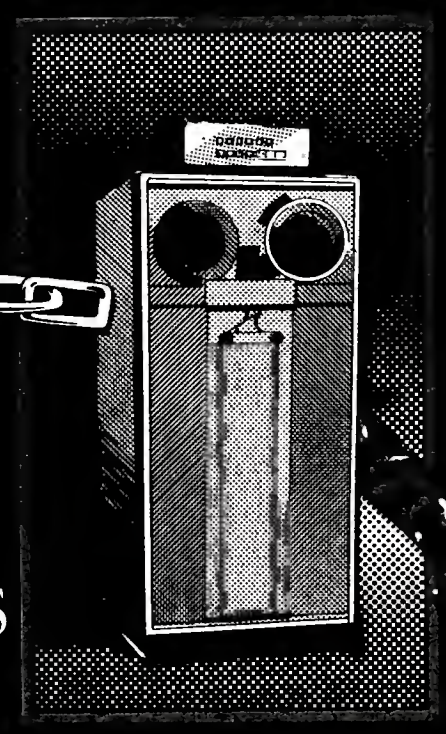
The group plans to expand the system's data communications capabilities so that the Operating Systems Department, which handles business systems applications, can send data to and receive data from the Computer-Aided Manufacturing (CAM) Department, which controls all the design and test data bases as they enter manufacturing from Radar Systems Engineering Design divisions. A second Tandem Non Stop II node currently resides in the CAM Department.



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Order processing system ties Toyota dealers worldwide

NAGOYA, Japan — Success brings problems peculiar to itself. Having gained a competitive position in the worldwide automobile market, Toyota Motor Sales U.S.A., Inc. here found that it needed to exert itself to maintain its place. With spare-parts stock levels on the increase and with an expanding worldwide customer service network, Toyota was in need of an order processing system accessible to Toyota branches and dealers throughout the world.

Major factors that Toyota's management considered were the requirement to reduce the time and cost of data capture and the need to simplify the processing of invoices. A computer-based, international order service system was needed.

Working closely with Toyota's Data Systems Department, General Electric Information Services Co. (Geisco) provided an international order service system that allows Toyota's branches on every continent to use a worldwide teleprocessing network for ordering spare parts and new vehicles directly from corporate headquarters in Japan.

Two of the companies involved are Toyota Germany, with its headquarters in Cologne, West Germany, and Ernst Frey oHG, Toyota's agent in Austria, with its head office in Vienna.

Supplies 1,000 dealers

More than 300 people work in the West German branch of Toyota, with departments for training, new vehicle marketing, customer service, administration and the central spare-parts store, which supplies spares to some 1,000 dealers located throughout West Germany. In total, 65,000 parts are held in inventory ready for immediate delivery to stores.

"Our larger authorized dealers, with their own spare-parts centers, are supplied with terminals that they use to send us the correct details when ordering spares," said Gunter Kirberg, head of operations and data processing for the West German branch. "Our own data processing department combines this information with details from our smaller dealers, and the parts needed are automatically booked out of the warehouses. Spares are dispatched the same day."

The current store's inventory is the basis on which the orders are compiled, and once the details have been entered into the local system, the orders are sent through Geisco's Mark III teleprocessing network. Ordering covers several thousand parts each month. In the other direction, order confirmations and invoices are received from Nagoya through the system.

A recent enhancement to the spares ordering system was the inclusion of new vehicle ordering. Previously, new vehicles were ordered via telefax, and advice notes from the works in Japan did not indicate the chassis numbers. Shipping notices now include the chassis numbers and are transmitted over the Mark III network. As Toyota handles about 5,000 vehicles every month, this part of the system is concerned with allocating vehicles to specific orders and entering the details on the local records.

"We now have totally accurate data handling and confirmation, and we have eliminated the errors that arose in the manual system," Kirberg said. The data is also more useful because it is more up to date, and the ordering process has also been simplified, he said.

'Useful extension'

"I think the system is a useful extension of our internal data processing resources and consider it to be especially important to the overall efficiency of our business," Kirberg concluded.

Because the spare-parts order entry system was already in use in West Germany, it was possible to expand it to include Austria without having to develop a completely new system. Frey, chief importer for Austria of Toyota and Bridgestone products, has its headquarters in Vienna and is currently the focal point for 200 appointed dealers throughout Austria.

The central stock of spares is housed in a modern, three-story warehouse, which covers an area of 48,000 square feet and holds 45,000 different items. Four thousand orders comprising some 30,000 items are handled every month. The volume of items and the amount of information involved eventually burst the seams of Frey's old ordering system.

Previous practice was to compile the proposed monthly spares order and then feed the order into the local data processing system, after which the orders themselves were airmailed to Toyota headquarters in Japan.

With the central data input and processing system in Nagoya, this meant that national organizations would receive acknowledgements and order confirmations about 12 weeks later, together with invoices, a reject list and a list of all technical modifications.

Long turnaround time

This long turnaround time on order acknowledgements was caused by the order data being sent monthly to Nagoya by mail for further processing. The information was then sent on a monthly schedule back to Vienna after additional data processing took place.

The uncertain time lag in the order scheduling and the consequent need for high stock levels led Frey to participate in the order processing system developed by Toyota and Geisco.

The orders submitted by dealers are now collected at the Vienna headquarters. The information is then entered and transmitted via the Geisco teleprocessing network to Toyota's Nagoya headquarters for further processing, with no need to send orders physically.

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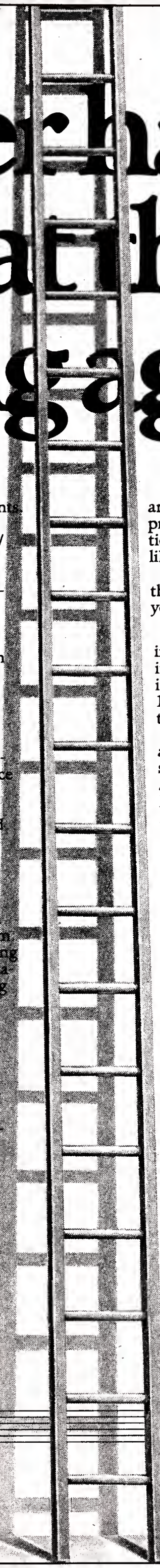
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NEWS

MVS training offered

NAPERVILLE, Ill. — Deltak, Inc. has introduced three training series for applications programmers, systems programmers and data processing managers who work with MVS.

"The Impact of MVS/XA," a two-course video series, covers enhancements to the MVS/SP operating system as introduced with MVS/SP Version 2 (MVS/XA) and describes four project phases for moving to MVS/XA.

The second multimedia course, "MVS/SP Catalogues," is for applications programmers, system programmers and other individuals who will be creating and updating MVS/SP catalogues.

The five-unit "MVS/SP-JES2" multimedia training course explains how to respond to hardware and software errors, prepare for and perform an initial program load, handle special IPL and system dump procedures and monitor mass storage, according to Deltak.

The courses are available for an average rental of $50 to $125 a month per course, depending on volume.

Courses also are available for purchase at $1,750 each. More information is available from Deltak, Inc., East/West Technological Center, 1751 W. Diehl Road, Naperville, Ill. 60566.

Local nets for micros subject of summer seminar in six cities

MINNEAPOLIS — "Personal Computer Local Networks," a two-day seminar sponsored by Architecture Technology Corp. here, will be held in six cities in June and July.

The seminar will discuss techniques and issues for connecting and installing networks and software, the sponsor said.

Software and important trends will also be explored, according to the sponsor.

The seminar will be held in Chicago, June 4-5; Minneapolis, June 6-7; Washington, D.C., June 13-14; San Diego, June 18-19; Boston, June 28-29; and San Francisco, July 11-12.

The seminar costs $645, the sponsor said.

Architecture Technology Corp. can be reached through P.O. Box 24344, Minneapolis, Minn. 55424.

Booklet details product entries, market changes

PENNSAUKEN, N.J. — Auerbach Publishers, Inc. has launched a newsletter, "Datagram," that will be available free of charge to subscribers of the company's *Microworld, Data World* and *Electronic Office* publications.

The purpose of the newsletter is to give subscribers "up-to-the-minute coverage of new products or significant changes and improvements" in the computer industry, according to a company spokesman. The six-page newsletter will be published "as often as necessary" to cover major announcements in the industry.

Datagram will include critical evaluations of hardware and software products, the spokesman said. The newsletter also can be accessed through Newsnet, Inc.'s Newsnet online information retrieval service.

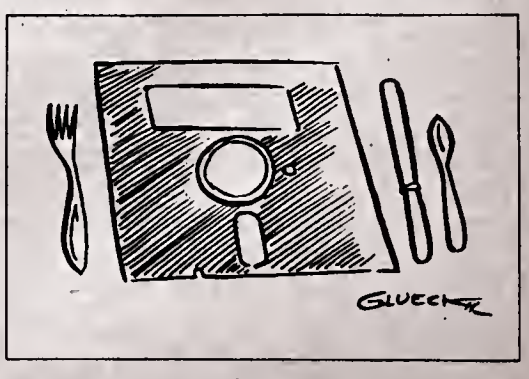
More information is available from Auerbach Publishers, Inc., 6560 N. Park Drive, Pennsauken, N.J. 08109.

Handbook on local nets to be revised

MINNEAPOLIS — The 1984 revised edition of Architecture Technology Corp.'s *Localnetter Designer's Handbook* will be available in late April. The 550-page handbook will consist of local network product summaries, design issue summaries and design guidelines, along with a special section on IBM.

This year's edition of the handbook will cost $65 ($80 outside the U.S.) if ordered by March 15. Orders after that date will be priced at $77 each ($93 outside the U.S.).

The price of the 1983 edition after the discount-buying deadline was $65. The handbook is available from Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424.



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BP-8-83

Shrimp processor's system stresses fast turnaround

BRUNSWICK, Ga. — Between the time a shrimper hauls in his nets and the moment a chef serves a shrimp cocktail delicacy, a metamorphosis takes place in the seafood industry. Frozen seafood processors such as King Shrimp Co., based here, utilize basic process-manufacturing techniques similar to other food companies. The raw seafood is received, graded out to size, prepared, processed, packaged, frozen and stored.

Because shrimp and other seafood are more perishable than most foods, the U.S. Food and Drug Administration has set strict standards on the processing of seafood. No more than 20 minutes is allowed for seafood to remain off ice during processing. This short lead time forces King Shrimp and other food processing companies to plan for fast inventory turnaround. When a company such as King Shrimp processes 40,000 pounds of perishable seafood a day in a highly dynamic processing environment, efficient materials control is essential. The problem most food processing companies have, according to Robert M. Duncan, manufacturing resources planning (MRP) project manager for King Shrimp, is that the "commonly accepted bill of material has a foreign flavor."

King Shrimp does not manufacture discrete items into subassemblies and assemblies, as do the discrete manufacturers. Instead, as pounds of raw material flow down fixed production lines, several manufacturing processes can be performed. This means that for the bill of material to be useful to King Shrimp or any food processor, it must do more than just tie discrete items together — it must also tie processes together.

Like many companies, King Shrimp had built its automated information system piece by piece, without any long-range plan. This approach limited the ability of King Shrimp's DP department to support the continued growth of the company. An inflexible system design, untimely reporting due to batch processing and the use of an IBM System/3 Model 12 computer became serious problems.

In 1980, King Shrimp management established an organization that was responsible for overcoming these problems and providing the company with an information system to support expected growth. The project was named Oasis, for One Accurate Simple Information System.

The Oasis project team chose Martin Marietta Data Systems, Inc.'s online MAS manufacturing control system, with a Hewlett-Packard Co. HP 3000 computer as the base, for a solution called the by-product bill of materials.

The by-product bill can specify an unlimited number of output items from a production work order, regardless of the number of input components. Every task in the by-product bill of materials grades and inspects for uniformity of the seafood products; nonuniform materials for one seafood product will be processed for another product. Thus, one lot of shrimp may be processed into six by-products.

Planning for by-products makes obsolete the standard processing philosophy, "If the produced item is not what was intended, rework it or scrap it." Unlike scrap, the by-product can have a greater value than the intended primary product. To King Shrimp, the only zero-valued scrap are the shrimp shells; almost everything else is a usable, valuable by-product. In simple terms, Duncan said, the bottom-line benefit of planning for by-product materials is, "If you don't plan for them, they're a liability — if you do plan for them, they're an asset."



Employees at King Shrimp work to meet their 20-minute processing time limit.

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Set Up Mode	Yes	Yes	No	No	Yes
Settable Tabs	Yes	Yes	No	No	Yes
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CALENDAR

WEEK OF APRIL 22

APRIL 25-27, COLUMBUS, OHIO — **Data Communications Systems.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

APRIL 25-27, SAN FRANCISCO — **Data Base Management Systems: A Comparative Analysis of General-Purpose Systems.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

APRIL 25-27, BALTIMORE — **Local-Area Networks.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

APRIL 25-27, BOSTON — **Computer Awareness: Basic Concepts, Capabilities and Terminology.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

APRIL 25-27, NEW BRUNSWICK, N.J. — **Network Communications Protocols.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

APRIL 25-27, CHICAGO — **Computer Operations: Effective Production Scheduling and Control.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

APRIL 25-27, SAN FRANCISCO — **Personal Computers and Networking.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

APRIL 25-27, ORLANDO, FLA. — **PC Introduction.** Contact: Harris Education Center, 6220 S. Orange Blossom Trail, Orlando, Fla. 32809.

APRIL 26, CLEVELAND — **A Rational Approach to Relational and Decision Support Systems.** Contact: Lynn Kolenich, Coopers & Lybrand, 2800 National City Center, Cleveland, Ohio 44114. Also being held April 27 in Boston.

APRIL 26-27, DENVER — **Data Communications: Advanced Concepts, Products and Services.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

APRIL 26-27, SAN FRANCISCO — **Computer Networks: Protocols, Standards and Capabilities.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

APRIL 26-27, BOSTON — **Business Aspects of Data Communications.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

WEEK OF APRIL 29

APRIL 29-MAY 2, PHOENIX — **Personal Computing: Productivity Tool for Business.** Contact: Diane Testa, International Data Corp., 5 Speen St., Framingham, Mass. 01701.

APRIL 29-MAY 2, SAN FRANCISCO — **The 1984 North American Society for Corporate Planning (NASCP) Conference: "From Steel to Silicon."** Contact: NASCP, P.O. Box 1288, 300 Arcade Sq., Dayton, Ohio 45402.

APRIL 29-MAY 2, CLEVELAND — **Association for Systems Management (ASM) Annual Conference.** Contact: Richard B. McCafrey, ASM, 24587 Bagley Road, Cleveland, Ohio 44138.

APRIL 29-MAY 3, SAN DIEGO — **Electronic Printing Systems/Directions in Digital Imaging Conference.** Contact: Dunn Technology, Inc., 759 E. Vista Way, Vista, Calif. 92083.

APRIL 29-MAY 4, ARLINGTON, VA. — **The International Society for Optical Engineering (Spie) Technical Symposium East 1984 and Instrument Exhibit.** Contact: Spie, P.O. Box 10, Bellingham, Wash. 98227.

APRIL 30, PHILADELPHIA — **Custom Software Systems for Rehab Facilities.** Contact: Management Information Systems, National Easter Seal Society, 2023 W. Ogden Ave., Chicago, Ill. 60612.

APRIL 30, NEW YORK — **Introduction to the IBM PC.** Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

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C		√	√	√	√
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COBOL Animator	√	√	√	√	TBA
Personal BASIC		√			TBA
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NEWS

APRIL 30, NEW YORK — **Strategies for the Successful Acquisition and Control of Microcomputers.** Contact: The Datamation Institute, Suite 415, 850 Boylston St., Chestnut Hill, Mass. 02167.

APRIL 30-MAY 1, COSTA MESA, CALIF. — **Dbase II.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

APRIL 30-MAY 1, NEW YORK — **Getting the Most out of VM/VSE.** Contact: Techtran, Box 10212, 72 Cummings Point Road, Stamford, Conn. 06904.

APRIL 30-MAY 2, HONOLULU — **Personal Computers and Networking.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

APRIL 30-MAY 2, NEW YORK — **Telecommunications Management: Equipment Planning, Selection and Use.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

APRIL 30-MAY 2, LOS ANGELES — **Introduction to Telecommunications.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

APRIL 30-MAY 4, CHICAGO — **CICS Macro-Level Programming.** Contact: Sysed, One Park Ave., New York, N.Y. 10016.

MAY 1, NEW YORK — **Micro-FCS.** Contact: Evaluation and Planning Systems, Inc., Suite 1540, 110 Plaza, New York, N.Y. 10119. Also being held May 9 in Philadelphia.

MAY 1-2, ANN ARBOR, MICH. — **Telecommunications Management in the Post-Divestiture World.** Contact: Marilyn Chasteen, The DMW Group, Inc., 2020 Hogback Road, Ann Arbor, Mich. 48104.

MAY 1-2, COSTA MESA, CALIF. — **Implementing Voice Technology.** Contact: Patti Restaino, Votan, 4487 Technology Drive, Fremont, Calif. 94538.

MAY 1-2, NEW YORK — **Personal Computers: A Hands-On Experience.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

MAY 1-3, CARY, N.C. — **SAS Macro Language Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

MAY 1-3, SAN FRANCISCO — **SAS Basic Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511. Also being held May 2-4 in New York.

MAY 1-3, SALT LAKE CITY — **1984 and Beyond: Managing Change in Tomorrow's Telecommunications Environment.** Contact: U.S. Telephone Association, Suite 1201, 1801 K St. N.W., Washington, D.C. 20006.

MAY 1-4, SAN DIEGO — **Microprocessor Software, Hardware and Interfacing.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45404, 6305 Arizona Place, Los Angeles, Calif. 90045. Also being held May 15-18 in Phoenix.

MAY 1-4, ATLANTA — **Structured Cobol.** Contact: Advanced Technology Systems, Inc., P.O. Box 6800, Norcross, Ga. 30091.

MAY 1-4, SAN DIEGO — **Defining Software Requirements, Specifications and Tests.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45404, 6305 Arizona Place, Los Angeles, Calif. 90045.

MAY 1-4, NEW YORK — **TSO/ISPF.** Contact: Sysed, One Park Ave., New York, N.Y. 10016.

MAY 1-4, SAN DIEGO — **Computer Network Design and Protocols.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45405, 6305 Arizona Place, Los Angeles, Calif. 90045. Also being held May 15-18 in Phoenix.

MAY 1-4, SAN DIEGO — **The 1984 Spring Hogan Systems Users Group.** Contact: Fred Saar, First Interstate Bank of Arizona, P.O. Box 20551, Phoenix, Ariz. 85036.

MAY 1-4, WASHINGTON, D.C. — **Designing with 16-Bit Micros.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45405, 6305 Arizona Place, Los Angeles, Calif. 90045.

MAY 1-4, LOS ANGELES — **Implementing Local-Area Networks.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45405, 6305 Arizona Place, Los Angeles, Calif. 90045.

MAY 1-4, WASHINGTON, D.C. — **Structured Design and Programming.** Contact: Ruth Dordick, Integrated Computer Sys-

See **MAY** page 67

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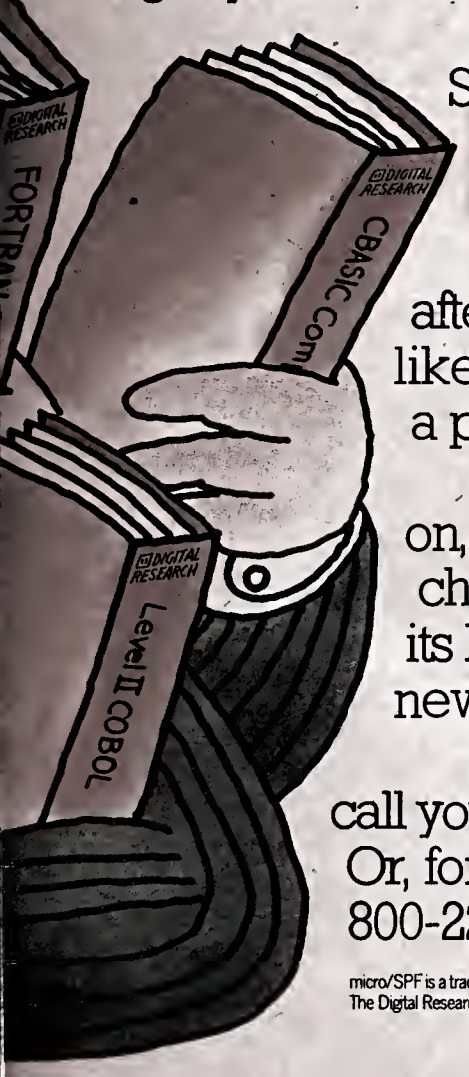
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NEWS

MAY from page 65

tems, P.O. Box 45405, 6305 Arizona Place, Los Angeles, Calif. 90045. Also being held May 15-18 in Los Angeles.

MAY 1-4, PALO ALTO — **Programming in C: A Hands-On Experience.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45405, 6305 Arizona Place, Los Angeles, Calif. 90045. Also being held May 15-18 in Palo Alto, Calif.

MAY 1-4, CHERRY HILL, N.J. — **Distributed Processing, Mini and Microcomputer Implementations.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45405, 6305 Arizona Place, Los Angeles, Calif. 90045. Also being held May 8-11 in Los Angeles.

MAY 2-3, ROSEMONT, ILL. — **The 1984 Computer Security Conference: Mini/Micro Computer Security.** Contact: SKK, Inc., 10400 W. Higgins Road, Rosemont, Ill. 60018.

MAY 2-3, NEW YORK — **Frost & Sullivan Conference: Networking Personal Computers.** Contact: Ginny Kania, Frost & Sullivan, 106 Fulton St., New York, N.Y. 10038.

MAY 2-3, NEW YORK — **How to Prepare a Strategic Plan for Office Automation.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

MAY 2-4, WASHINGTON, D.C. — **Data Base Management Systems: Concepts and Guidelines.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

MAY 2-4, WASHINGTON, D.C. — **Network Design.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

MAY 2-4, SAN FRANCISCO — **SAS Processing Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

MAY 2-4, DEARBORN, MICH. — **Industrial Robotics, Flexible Manufacturing and Product Design for Automation Hands-On Workshop.** Contact: The University of Michigan-Dearborn, Graduate Study Center and Extension Service, 4901 Evergreen Road, Dearborn, Mich. 48128.

MAY 2-4, CHICAGO — **Project Management: A Practical Approach.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

MAY 3-4, SAN FRANCISCO — **Association of Small Systems Users Exposition (ASSU) 1984.** Contact: ASSU, William Zimmerman, Williams & Lane, Inc., 1077 Eastshore Highway, Berkeley, Calif. 94710.

MAY 3-4, SAN FRANCISCO — **Fourth-Generation Systems and Language.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

MAY 4-7, LAS VEGAS — **Society of Telecommunications Consultants 1984 Spring Conference.** Contact: Society of Telecommunications Consultants, Suite 1410, One Rockefeller Plaza, New York, N.Y. 10020.

MAY 5-6, CHICAGO — **CICS Command-Level Intensive.** Contact: Sysed, One Park Ave., New York, N.Y. 10016.

WEEK OF MAY 6

MAY 6-8, MONTEREY, CALIF. — **Document-Based Optical Mass-Memory Systems.** Contact: Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

MAY 6-9, TAMPA, FLA. — **Communications Expo 1984.** Contact: Latcom, Inc., 4135 Laguna St., Coral Gables, Fla. 33146.

MAY 7, CHICAGO — **Dbase II.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

MAY 7-8, BOSTON — **Computer Networks: Protocols, Standards and Compatibility.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

MAY 7-8, WASHINGTON, D.C. — **Satellite Technology Seminar.** Contact: Vicki Schellase, Phillips Publishing, Inc., Suite 1200N, 7315 Wisconsin Ave., Bethesda, Md. 20814.

MAY 7-9, PARSIPPANY, N.J. — **Vsam in Cobol.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

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EDITORIAL

Political football out of bounds

The political football known as export control was kicked out of bounds by President Reagan's recent order giving the U.S. Department of Defense selective export license review of high-technology shipments to many of our allies [CW, April 2].

National security interests notwithstanding, that sort of control clearly should not reside in the hands of military strategists. In this case, the proper bureau is the U.S. Department of Commerce or, because of the poor job Commerce has done in this area in the past, the U.S. Customs Service.

The military will take too parochial a view in deciding the propriety of export license applications, likely assuming a conservative posture that does not always recognize the legitimate concerns and needs of U.S. manufacturers, not to mention the needs of our allies. Defense has in the past demonstrated a knack for ignoring such legitimate concerns. Consider, for example, 1981, when it stonewalled efforts of U.S. manufacturers to sell pipeline equipment to the Soviets for a line that would carry oil to Western Europe.

But the real problem at hand is not direct Defense intervention into trade matters. The real problem is congressional policy or, to be more specific, its absence. In this year, as in other election years, Congress remains a house conveniently divided on several key issues, one being the renewal of the Export Administration Act, which governs exportation of potentially strategic products and materials.

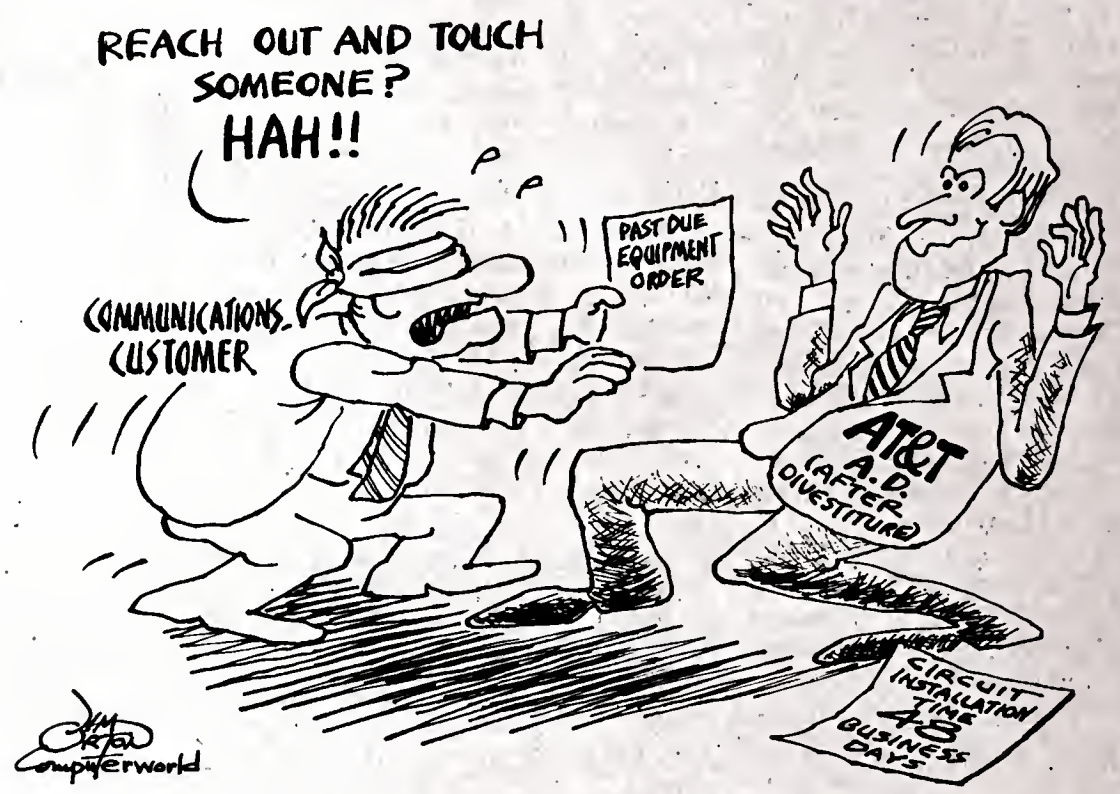
In effect, the president has seized an opportunity presented by the ongoing differences between the House and Senate to ensure that sensitive U.S. high technology stays out of the hands of the Eastern bloc. The president, no doubt, garnered more support for his order with several recent arrests of individuals trying to smuggle computers and computer-making equipment into the East.

Computerworld has always maintained that shipments of computers that can be plugged into military applications should be restricted. But shipments to whom? Our allies? And who or what agency should decide what needs to be restricted?

By this Friday, April 13, the House and Senate are supposed to hammer out the differences between their versions of the Export Administration Act. The compromise — if, indeed, one is reached (the Export Administration Act expired last September) — must somehow straddle the fine line between protection of our technology and protection of our commercial interests.

Both the House and Senate versions of the Export Administration Act recognize that it is futile to place strict export controls on goods that are readily available from non-U.S. sources. But a key difference between the two bills is the Senate's inclusion of a greater Defense role in the review of export licenses.

Not only will congressional passage of this feature lead to more costly delays for license approvals, but it will also place too much control in the wrong hands. Defense's track record in matters such as these speaks for itself.



LETTERS

Cartoon is entertaining, but it places Fortune under wrong light

The cartoon alongside the article "Reorganization seen way of life for micro makers" [CW, Feb. 13], featuring a crocodile ascending toward five computer companies, is entertaining but, at least in one significant sense, incorrect.

Fortune Systems Corp. does not belong in the group of hapless, soon-to-be-devoured computer companies any more than any of the most established companies in the business does. We at Fortune do not spend our days outrunning creditors for several good reasons. To begin with, there is little company debt. As of Dec. 31, we had over $53 million in our bank accounts, and we have adopted a strongly conservative fiscal policy at the company.

In addition, Fortune is committed to a strong product program and currently assigns over 15% of annual revenues to research and development of our products. Our customer base is solid and growing fast.

We understand that the perception of Fortune's misfortunes has in recent months outrun the reality of the situation, and we are correcting those impressions.

We seem to be succeeding in correcting the impressions: Industry analysts and the trade press are now seeing the error of including Fortune as a member of the unlucky group.

James S. Campbell
President
Fortune Systems Corp.

***Computerworld** welcomes letters from its readers. Preference will be given to typed, double-spaced letters of 150 words or less; they may be edited for the purposes of clarity and brevity.*

*Letters should be addressed to **Editor, Computerworld, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.***

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VIEWPOINT

MIS and a state-of-the-art environment



THE DATA CENTER
John P. Murray

The use of available technology, both hardware and software, to snowplow MIS concerns, the installation and subsequent aggressive use of data base management systems, of fourth-generation programming languages and information centers are not only valid concepts, they are necessary if MIS is to realize its potential.

While the benefits that can be obtained from the effective, aggressive use of state-of-the-art technology are many, moving to that environment and maintaining that environment are time-consuming, frustrating and, of course, expensive propositions.

In spite of these considerations, the continuous pursuit of a state-of-the-art environment is not only a most desirable goal, but also a necessary one. The eventual success or failure of the organization may rest upon the determination of the organization's MIS management to move to and then to maintain the state-of-the-art environment.

Indeed, in some organizations, this will be a massive task; in some organizations, it may be too late to make the transition successfully. It is hard to say what the future holds for such organizations, but difficult times are bound to be ahead.

These situations are usually the result of failure in several areas. Organizations do not overnight fall into situations in which they become captives of obsolete technology and practices. They come to such circumstances as a result of indifference and neglect on the part of MIS management and, to varying degrees, the organization's senior management.

MIS managers should be criticized for failure to move the organization to a state-of-the-art environment, but senior management must also accept some of the responsibility, particularly in those instances in which they have been indifferent to the needs and the potential of MIS. MIS must work to build a state-of-the-art case; senior management should listen and should support the effort.

Sooner or later, the issue of the expense associated with the development of the state of the art will arise. Moving to a state-of-the-art MIS environment is not and probably never will be inexpensive. However, there are options available, some of which are less expensive than others. It is as true with these considerations as it is with anything else that while in most cases you get no more than what you are willing to pay for, you can, as a number of organizations have discovered, get much less than you pay for. So use caution when considering the various options.

The process of movement to a state-of-the-art environment should begin with the development of a plan that assesses the current level of information processing technology within the organization and then lays out a course to reach the desired state-of-the-art level. The most ambitious, practical plan is the one that should be pushed. However, lower cost contingency plans should also be developed for consideration in the event cost becomes a paramount issue.

Employers working through Nova . . . have cut their costs dramatically. . . . Also, feedback from the employers to the college helps make the academic program more responsive to the needs of the workplace.

The best approach is to press for the ultimate plan; if that cannot be attained, go for the next level.

Beginning with the assumption that the best solution will not be approved is not a positive method to use to gain a state-of-the-art position; you never know what will happen until you try. MIS should press for whatever plan it feels is best for the organization. Cost should be a secondary issue if the results justify the expense.

The proposed state-of-the-art plan that is presented to the organization's senior management should be as comprehensive as possible. The plan must be realistic. The goals identified in the plan must be attainable. The plan itself should be developed on a phased basis; everything cannot be done at once. The use of a phased approach will reduce the pressure, and it will also help spread the cost over a longer term.

The temptation to engage in game playing, not to own up to all the known costs because of a fear of rejection, must be resisted. Of course, as progress is made, as the technology changes, unanticipated costs may arise. Such costs can be dealt with as they arise. The practice of hiding or ignoring known costs is not the way to sell the state-of-the-art venture.

There is a definite advantage to developing the state-of-the-art plan in a comprehensive, factual manner and in addressing the issue of expense at the onset. As progress is made, the issue of the cost is almost certain to arise. Being able to go back to the original plan to demonstrate that these costs were considered and included and that the issue of cost has been handled in a candid and consistent manner not only helps increase the MIS manager's comfort level, but also adds to the credibility of MIS.

MIS management must become aware of the urgency of bringing its organization to a reasonable state-of-the-art status. It must do the best it can to impress upon senior management the correctness of such an effort. In addition, the issue of the funding of the effort must be addressed. The ultimate decision, of course, rests with senior management. That decision must be made with full knowledge of the probable costs involved.

Considering the vast number of organizations that have little in the way of state-of-the-art processing and have no plans to do anything, this is an issue that will gain increasing attention in the future. The potential in many organizations is great; those who have responsibility for the information processing function should act now to get the effort under way. The funding of the effort must be addressed and resolved so the work can begin. ‡

Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, *published by Dow Jones-Irwin.*

Work/study course nurtures budding DPers



HUMAN CONNECTION
Jack Stone

Information processing centers are rapidly becoming recruitment nightmares, if not reaching a crisis level. Experienced professionals cost an arm and a leg, and there is no guarantee they will easily integrate into the current teams after coming on board. Combing campuses for juniors is very expensive, as is the inevitable follow-up training, and all too frequently, the recruitees are rejected after the trial period. The process tends to put a drain on resources, especially on the patience of the senior DP staff. There has to be a better way.

One approach that seems to be working well is that taken by Northern Virginia Community College (Nova), Alexandria, Va., where cooperative education programs in data processing — perhaps better known as work/study — operate in full swing at each of its five campuses.

The basic idea behind the program is the integration of academic work with on-the-job training. However, Nova has to an exceptional degree refined the concept:

■ The college refers candidates for entry-level positions ranging from systems analysts to systems programmers and from data base managers to programmer/operators.

■ The college prepares its students with a basic understanding and skills in all major programming languages.

■ Various education patterns are offered: two students taking turns in a single full-time position; one student in part-time employment and part-time college; and a combination of the two.

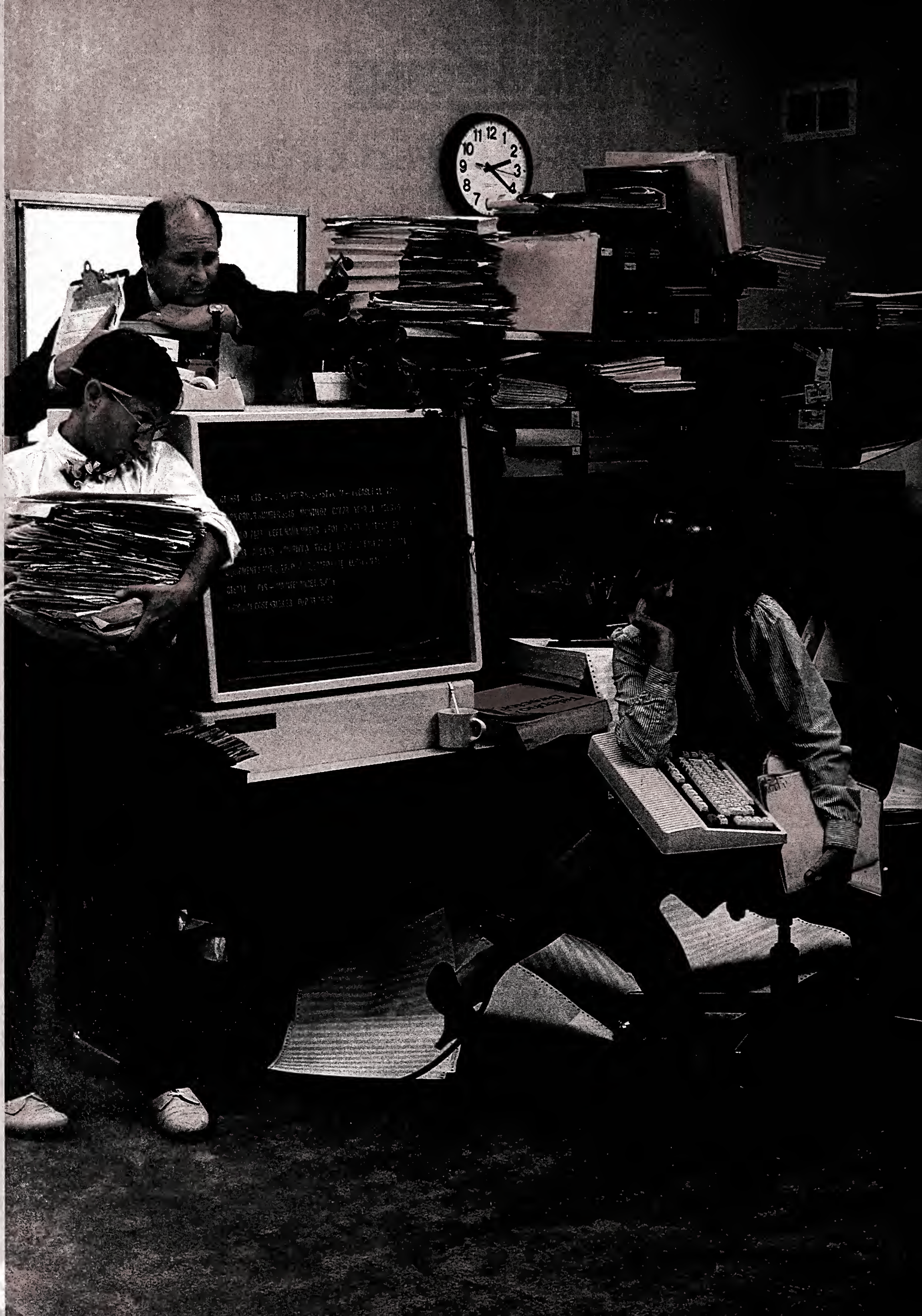
Many advantages accrue to employers who participate with the college. For one thing, a continuous supply of temporary employees is available, most of whom can qualify for permanent status. In fact, a high percentage of students has been offered and has accepted full-time work with participating employers. Moreover, the employer can select employment candidates whose educational backgrounds meet specific requirements.

Employers working through Nova . . . have cut their costs dramatically. . . . Also, feedback from the employers to the college helps make the academic program more responsive to the needs of the workplace.

Employers working through Nova, rather than handling recruitment and training on their own, have cut their costs dramatically, because Nova handles the initial recruitment and training and refers candidates only after careful screening. Also, feedback from the employers to the college helps make the academic program more responsive to the needs of the workplace.

One of the major reasons for the success of the program is that employers must make a strong, but not unreasonable, commitment. They must recognize that the on-the-job segment of the program is intended to meet educational goals primarily and business goals secondarily. As a consequence, the employer must provide job experiences whose goals are closely coordinated with those of the academic program. To help assure the commitment, a program coordinator from the employer's staff is assigned the responsibility for student supervision and evaluation. In addition, the student must receive a salary commensurate with others in similar situations who perform similar tasks.

Nova presented a survey with impressive data: recruitment yield, that is, persons hired vs. those offered jobs, was 13 times greater for cooperative education students than for recent college graduates. Employers rated work performance of cooperative education students about comparable to that of college graduates, yet recruitment costs were about one-tenth as much. ‡



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VIEWPOINT

Implementing contingency disaster/recovery planning

READER'S PLATFORM
Alvin Arnell

In relatively few years, the phrase "contingency disaster/recovery planning" has acquired a meaning in information processing center management. Security and disaster planning personnel and departments have increased in number at an almost phenomenal rate during the past few years. Although in many instances contingency disaster/recovery planners hardly embrace all the things that are required to be done, contingency disaster/recovery planning has so implanted itself in people's minds that it seems to be recognized by officials in industry and government as an acceptable requirement and as a necessity of everyday business.

Yet with all the recognition and acceptance of the necessity to protect vital records and computer systems, management pays little but lip service to the implementation of a contingency disaster/recovery program.

The nature of computer systems and installations varies substantially between companies and government agencies. The organization structure, and the management charter under which the computer operation and utilization operates, has an important influence on the types of security and data protection programs that are undertaken. Furthermore, the procedures and operating personnel have a direct effect on limiting or increasing the degree of complexity of the security and disaster planning activity.

What exactly is the field of contingency disaster/recovery planning? Where does it fit into the total picture of computer operations and information processing? Who is responsible for the concept, organization, design and implementation of the plan and for monitoring the plan? What does the person responsible for the program do?

First, contingency disaster/recovery planning is a top-down/bottom-up responsibility. The development of a program requires substantial support on all levels of management, that is, recognition of the problem; provision of the economic and physical resources that will enable the project to be undertaken and followed through to a conclusion; and maintenance support in monitoring and testing the plan at reasonable intervals.

Why should management be concerned about the continuity of operation of a data processing center? The answer is dependency, total and complete dependency on the capability of computer operations to perform continuously to provide daily information processing in virtually every phase of business activity — the very survival of our modern corporate structures and governmental operations dedicated to our national security. What company or government agency can return to manual operations?

Management must be involved in deciding, doing and evaluating the things to be done to protect this vital asset.

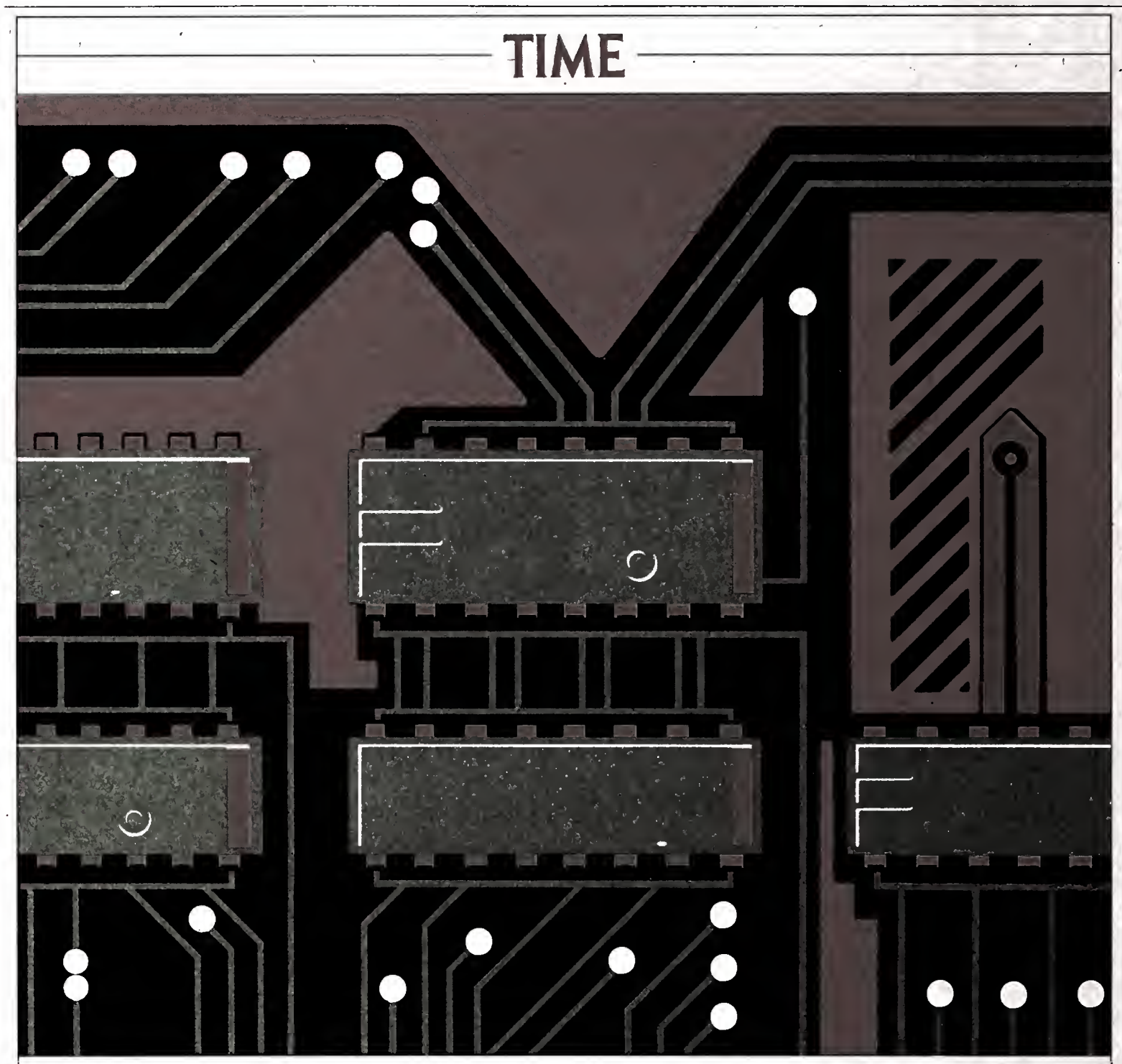
'At-risk' posture

Disasters, natural or man-made, pervade the computer installation every hour of every day. What executive in today's modern business environment will accept the risk of losing his company's data base or operating system? If executives and government officials accept the fact that computer operations are the core of their survival, then why, with the capability of doing something about its protection, do they continue to accept an "at-risk posture?"

There is no magic formula or potion that, once applied, will insulate critical and sensitive computer systems from disaster. Yet it is possible to provide for, implement and manage a system that will eliminate or mitigate the potential hazards and vulnerability or, in the event of a catastrophe, provide for recovery within a reasonable and acceptable period without jeopardizing the survival of the company.

Some guidelines for contingency planning are:

- **What must be done.** This includes planning, management policy-making, establishing work objectives, identifying all user departments and operations and determining necessary servicing goals of various departments.
- **When it must be done.** Contingency planning should be done immediately. Establish the critical requirements, list and review priorities, and see that they conform to management's needs. Then program the results.
- **Who must do it.** Management must delegate authority and coordinate the work being performed. Establish the functional relationships between user departments.
- **How is the job to be done.** Develop all of the parameters, systems, procedures, methods, qualitative goals and standards.
- **What is needed to do the job.** Management must apply its efforts and financial and personal resources



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VIEWPOINT

to ensure a satisfactory conclusion to the project.

■ **Get the job done.** Procrastination is a company's worst enemy. If all of the above is implemented, the time, effort and financial resources must be applied immediately.

■ **Does what has been done make sense.** Is the plan that is developed practical? Can it be implemented?

■ **Is the plan complete.** Can the plan be tested? Will it work?

■ **Can the plan be improved.** Can the plan be modified in any significant way?

■ **Management must support the plan on a continual basis.** The plan must get support throughout its development and after it is completed.

Approaching contingency disaster/recovery planning is no different from any other business planning activity. It involves the analysis of corporate policies, procedures, requirements, forms and equipment applied to the protection, security and maintenance of continuity of the data processing or information system.

Other corporate functions — production, marketing, finance, purchasing, industrial relations, employee protection and safety — all have objectives, and the objectives lead to plans.

Then why not contingency disaster/recovery planning for the very heart and soul of the company?

Evolutionary nature

Contingency disaster/recovery systems and plans are evolutionary in nature. As the system changes, expands and decentralizes, so does the need for new concepts and new approaches.

In light of the revolutionary nature of the computer industry, contingency disaster/recovery planning works on the system function itself and its evolutionary cycle.

The first phase of contingency disaster/recovery planning should start the day the first piece of DP equipment enters the administrative planning and control scene.

At that moment, management should recognize and introduce the planning and controls necessary to protect this precious environment. Unfortunately, management is sometimes more anxious to play with this environment than to determine how it could be hurt by it.

The second phase occurs when the corporate user community determines that it could benefit from this multifaceted benefactor. Again, sometimes the toy-like aspect of it all, rather than procedures planning and forward thinking on an organizational level, becomes important; possible future problems are overlooked or ignored.

As the enterprise continues to grow, organizing the procedures to solve the problems becomes more complex. The consequence is the constant increase in DP demands without attendance to the potential vulnerability of the system. As often happens in such a situation, the work loan increases, diminishing the availability of time on the part of operating supervisors and managers to address themselves to the growing problem. The decision is to abandon even a part-time planning procedure in favor of no planning at all.

The third cycle of abandonment comes at a time when it is important to enter the fourth phase — procrastination — in favor of establishing and applying company economic and personnel resources to expand the DP operation.

The final cycle is then set in place: the introduction of outside consultants. Again, issues of vulnerability are ignored.

The long-range information handling system plan can be achieved by applying new equipment and new technology to the solution of the data processing operation.

But the planning and design of improved MIS and data processing operations cannot be considered solely in terms of equipment, technology and mathematical techniques.

There is no alternative to not improving a company's information system. But management must address itself to the issues that will protect, secure, preserve and maintain the continuity of DP and corporate operations. ‡

Arnell is president of Dialog Consultants, a division of Vault Management Corp., located in Garden City, N.Y.

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VIEWPOINT

Mumps 1983 needs second look

READER'S PLATFORM
Charles Volkstorf

Standard Mumps, a general-purpose programming language, is undergoing its five-year American National Standards Institute (Ansi) revision. As a member of the canvas list, I am responsible for voting on the acceptance of the new standard, titled Draft Ansi X11.1-1983.

Since Mumps' original standardization in 1977, the Mumps Development Committee has taken two polls (in 1977 and 1980) of Mumps users and vendors. Both polls showed that the top two deficiencies of Mumps are a lack of parameter passing and block structuring. Parameter passing allows programmers to interface independently written programs without concern for variable name conflicts. Block structuring allows one to declare and access sections of code in a modular fashion. Both capabilities are almost universally available in other programming languages. Mumps 1983 includes neither.

Altogether, 14 changes were made to Mumps. Ten are simple conveniences, and two others round out the language's capabilities. The other two changes to Mumps, $ORDER and SET $PIECE, are significant additions to the language.

Nonnegative integers

Subscripts (keys to direct-access files) in 1977 Mumps are nonnegative integers (0,1,2,3, . . .). $NEXT is used to read all records with given subscript values. A value of -1 indicates the end of file. Mumps 1983 allows free-text subscripts, which would include -1. To detect the end of file, a new function, $ORDER, has been added, which performs the same functions as $NEXT, but with the empty string (zero length) as the end-of-file indicator.

Having two features that perform almost the same function confuses the issue. The existing function, $NEXT, is discarded as deadwood, while a new function, $ORDER, "is strongly encouraged in place of $NEXT." It would be simpler to use $NEXT as is. How to do this best depends on what subscripts are allowed to occur.

Here the Mumps Development Committee is inconsistent. Page I-20 refers to "negative numeric subscript values," while Page III-2 states that subscripts are "nonnegative only." In practice, negative subscripts (keys) are rarely used. Furthermore, if ever needed, they can be avoided by adding a large number to the value to convert it to a positive number before using it as a subscript. The Mumps Development Committee already limits its subscripts to no more than 31 printable characters. Negative subscripts could likewise be disallowed.

Without negative subscripts, we could use $NEXT as is. We could also allow the empty string to be a subscript. Then we could compile free-text field value statistics without having to make a special check for the empty string. Programmers sometimes overlook this until the program aborts when the empty string is first encountered.

The subscript ordering scheme could also be better defined. Currently, the order is: empty string, numbers, other strings. The empty string could remain with the other strings to simplify the order: numbers, other strings.

If we do allow negative subscripts, we can still continue to use $NEXT as is. $NEXT is not actually ambiguous. When we reach -1, if the prior subscript precedes -1 and -1 is a defined subscript, then we have reached subscript -1. Otherwise, we have reached the end of file.

Alternately, we could declare, with a new command, that the end-of-file indicator for $NEXT is the empty string. We would do this just once, at the beginning of any application package, and use $NEXT throughout instead of $ORDER.

Mumps allows multiple fields to be concatenated together into one value so that they may be stored and retrieved in one file access. To allow us to change easily a single field stored this way, the syntax SET $PIECE has been introduced. However, it uses functions and arguments in a manner that does not occur anywhere else in Mumps. It is very legible because it is in the Cobol style of having an arbitrary sequence of reserved words and expressions for each construct. However, Mumps consists of a small set of well-chosen functions and operators that can be combined to perform complex operations.

The capabilities of SET $PIECE can be provided with a normal Mumps function that returns the new value after one field is changed. Simply adding another argument to $PIECE would accomplish this. This would be more general than SET $PIECE, as we could use this function in conjunction with the existing functions and operators. We could even pad fields with arbitrary characters. In 1977, the representative from Massachusetts General Hospital in Boston (where Mumps originated) identified two uses for alternate padding values: "a string of dashes" and

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"a string of alternating dashes and spaces."

This would also generally be more efficient in terms of disks. Typically, the user identifies an item, then enters new values for one or more of its fields. In this case, SET $PIECE retrieves the existing fields, alters one, then stores them back into the file. A new function would determine the new value, then store it into the file, making only one file reference instead of two.

Furthermore, SET $PIECE specifies that references to files that are not defined will use an empty string for their value. This principle is useful in tallying statistics in which the first occurrence of a value is assumed to have a total of zero without initializing it beforehand. However, SET $PIECE is changing a single field value. If the file entry is missing, it will initialize all other field values to empty strings. It should abort and be fixed.

Shorten expressions

Many of the changes to Mumps debated by the Mumps Development Committee serve only to shorten frequently used expressions.

Rather than shrinking the syntax of each reference to concatenation or $PIECE, we can make Mumps even more concise and efficient by combining multiple occurrences of these operations into one. A new function, for example, $KONCATENATE, could concatenate its arguments together. Similarly, allowing multiple piece (field) numbers in $PIECE would allow us to move several fields at once into individual program variables. (Both the piece numbers and variable names could be separated by, say, a dollar sign.) We would then be manipulating sets of values, which mathematicians call "tuples."

We could also use tuples to retrieve an interval of subscripts from a file. Then we could move sets of field values back and forth between files, local arrays and individual program variables. Using the Mumps FOR loop, we could cycle through these values, providing another solution to the $NEXT/$ORDER problem. Using the WRITE command, programmers could examine selected local arrays.

This would encourage programmers to use sets of variable names, such as NAME, DR and DEPT, rather than array references, such as P(1), P(2) and P(3), which are now easier to use, but harder to understand.

What other sets would make useful tuples? We can answer this by examining loops in existing programs to determine what sets of values programmers manipulate. To do so, I wrote a Mumps program to list out every loop in a given program and ran it against two major systems. Altogether, 414,365 characters were examined, containing 2,038 loops, one loop per 203 characters of code. These loops were manually classified. A total of 10 types of loops were detected: reads (38%), file subscripts (24%), sequential lists (13%), local array subscripts (12%), fixed sets of values (3%), string pieces (3%), sequential search (3%), fixed numeric intervals (2%), from/to intervals (1%) and individual characters (1%).

The Mumps FOR loop handles 26% of these, while the tuple proposal handles 36%, leaving the 38% READ loops.

A READ loop performs no initializing or incrementing. It only reads a value from a terminal, repeating until no more input is entered. The Mumps QUIT command terminates a FOR loop, so all we need is a FOR with no argument to loop until we QUIT, due to there being no more input. Then all 10 types of loops could be easily represented without using GOTO.

The WHILE command is useful in eliminating the GOTO command in such structured languages as Algol and Pascal. However, it eliminates only the GOTO. We still must initialize, increment and check for the end of the loop. The tuple construct, in contrast, performs all of these chores for the programmer.

It is also the case that the algorithms and data structures being utilized in a number of popular implementations of Mumps could be improved.

Integer subscripts (72% of all subscripts, by my own tally) could be stored two digits per byte, instead of one. A disk set should process independently of the program initiating it to allow the program to continue simultaneously. The disk queue should be processed in the order of the blocks on the disk, rather than in the random order in which the requests occur, to eliminate most of the seek time. Each disk drive should have its own queue to allow all drives to be active simultaneously. Mumps should be totally compiled, except for the .6% that is execution and indirection, rather than semicompiling all of it.

A thorough examination of 1977 Mumps, 1983 Mumps and the deliberations of the Mumps Development Committee shows the following:

- The top concerns of users and vendors, parameter passing and block structuring, are still missing from 1983 Mumps.
- For the changes being made to Mumps, alternate approaches that are simpler, more general and more efficient should be considered.
- The document itself (Draft Ansi X11.1-1983) should be examined closely for inconsistencies and erroneous definitions. Examples of each Mumps construct and the intended result should be given to rectify ambiguities and implementors' misinterpretations.

It is clear that the proposed revision to Mumps should be withdrawn and further studied. ‡

Volkstorf is vice-president of Compumedical Volks, Inc. in Boston.



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VIEWPOINT

Personal computers changing perception of office work

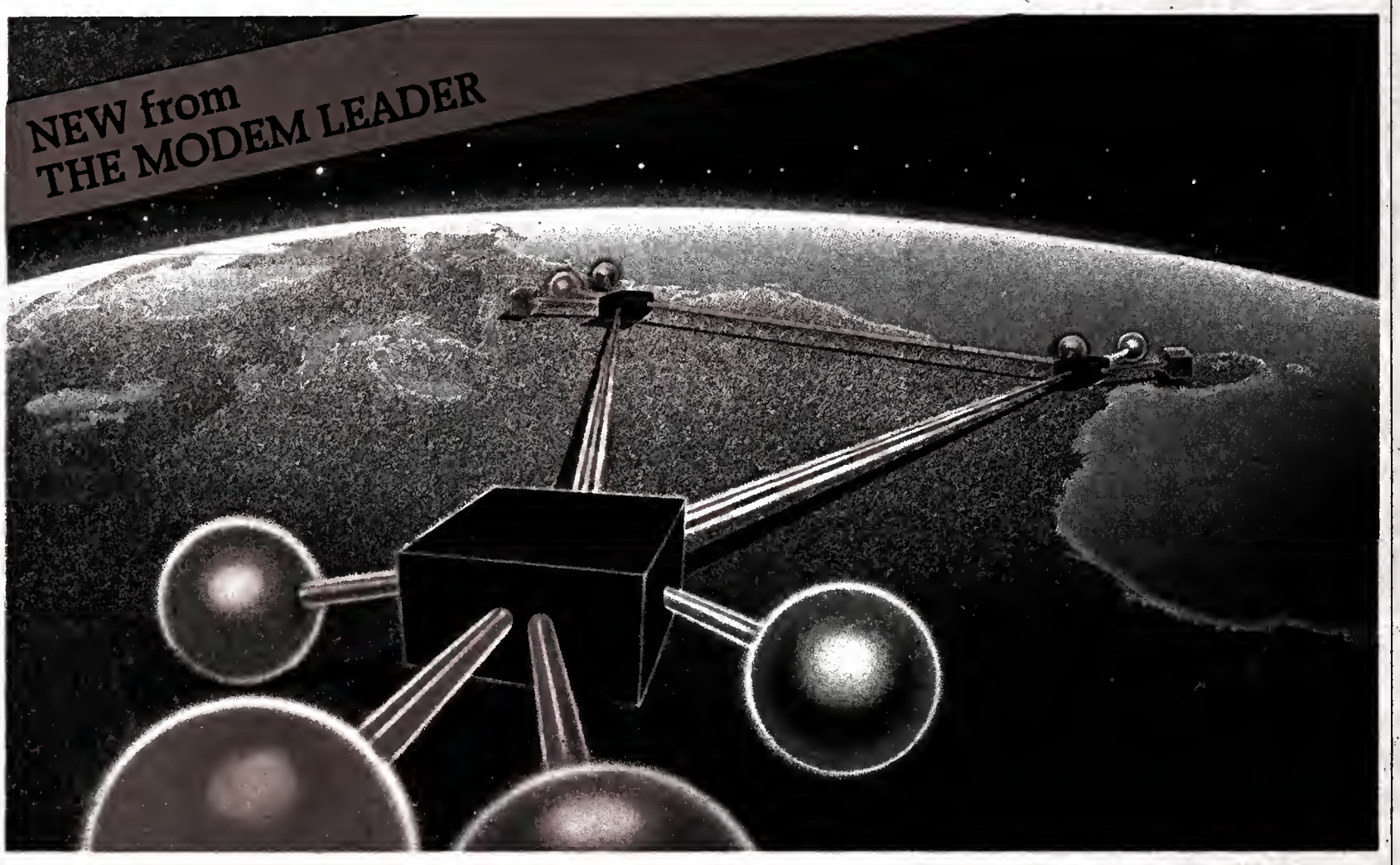
The remarks made by David Kearns, in the article "OA efforts lack focus, Xerox chief charges" [CW, Feb. 27], reminded me of that classic headline: "Pot calls kettle black."

Office automation vendors and their customers have found it mutually advantageous to preserve the conventional notion of the office as a place where people handle information. Both sides have benefited from limiting changes to a succession of modest improvements in discrete aids for paper-oriented and manpower-dependent office functions. Buyers of OA have thus been enabled to maintain or expand their work force — the traditional measure of power and prestige. Sellers have been able to build an apparently reliable long-term market for their products. This situation seems unlikely to persist much longer, however.

LETTERS

Personal computers, especially in their portable form, are changing the perception and the performance of what is usually classified as office work. People, paper, place, procedures, communications and information assume different priorities and relationships in the new working arrangements that are beginning to evolve. Such an environment demands the design and assembly of customized systems that are readily adaptable to changes in personnel and goals. How long before this reformulation of practices has a significant impact on the current approach to OA? The answer depends on whether established producers and users elect to resist change or promote it.

Brian LeBert-Francis
Falls Church, Va.



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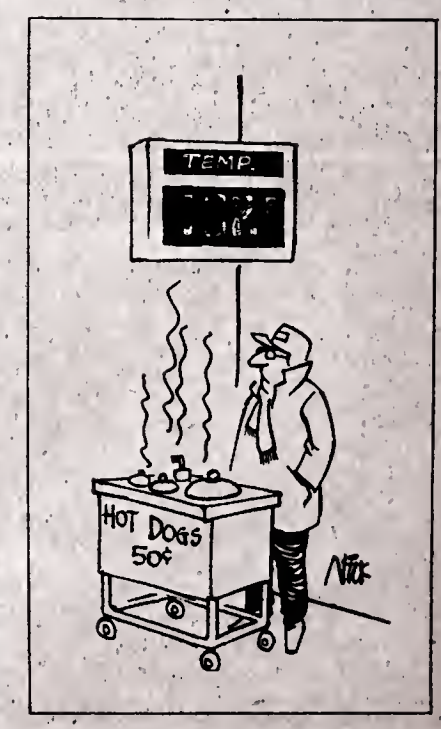
Solution already given

The article "The problem you may not know you have" [CW, Feb. 13] on the programming problems that will be encountered in the year 2000 stated that the issue has attracted little industry attention. However, an excellent solution to the problem appeared less than two years ago in *Computerworld* itself.

In a letter published in *Computerworld's* Sept. 27, 1982 issue, Richard L. Conner suggested using an absolute date in data base files that could easily be converted to month/day/year format when the date is to be displayed or printed. The two conversion algorithms discussed by Conner were written in Fortran by H.F. Fliegel and T.C. Van Flandern and were published in the October 1968 issue of *Communications of the Association for Computing Machinery*. This absolute or serial method of reckoning dates is widely known to astronomers, especially those specializing in celestial mechanics and time determination (one of the authors, Van Flandern, is on the staff of the U.S. Naval Observatory in Washington, D.C.).

The absolute date method is simple, ingenious and free of charge.

James E. Pleger
Herndon, Va.



SOFTWARE & SERVICES

Loans processing system out for IBM CPUs

By Paul Gillin
CW Staff

DALLAS — Hogan Systems, Inc. last week announced for IBM mainframes the Integrated Loans Processing System which, it said, covers the full scope of lending activities from original application to final disposition.

The system uses common data bases, processing routines and operating procedures and is fully integrated with the Hogan Deposit Systems, Prophet Customer Management System, On-line Delivery System and Hogan Collection System. The Integrated Loans Processing System also generates transactions for direct entry to a general ledger, the vendor said.

Modules are included for tracking loan applications, loan accounting and servicing, secondary marketing, collateral control, commitments, investor accounting and reporting and charged-off loans. Support is provided for multicompany, multioffice environments with the ability to define different options for each branch.

User-defined control information includes variable factors, processing routines and report and transaction definitions. The system satisfies all federal requirements and can be modified through Hogan's maintenance service to accommodate changing requirements.

The software can accomplish daily processing using a random approach that processes only loans that have seen activity rather than reading files sequentially, the vendor said. On-line operation is offered as well as batch processing and combinations of the two. Conversion to the new software can be carried out gradually.

Automated loan origination allows the terms of each loan to be entered on-line with changeable parameters, Hogan claimed. When data on a new loan is entered, the system automatically submits subsequent screens for that particular loan type.

The loans-in-process feature provides loan application status reports and on-line inquiries and highlights overdue documents, verifications and appraisals. It also automatically prints documents associated with different types of loans.

Other modules include a borrower system, which contains profiles on each borrower; a collateral system with a common data base; a payee system that tracks funds recipients; an investor servicing system with a common data base; standard reporting features; standard processing functions; and a variety of common computations.

The total system includes 771 programs, 243 batch and 66 on-line reports, nearly 2,400 total librarian members, 46 hierarchical data bases and 54 sequential data bases. It licenses for $500,000.

Hogan is located at 5080 Spectrum Drive, Dallas, Texas 75248.

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SOFTLINE/LAYNE R. ALEXANDER

Cutting project management risks

The traditional role of the project manager — having responsibility for a project, with little or no authority — is risky business. A person assuming the job of project manager risks his personal image and career as well as the careers of all associated with the project. This article will discuss two methods that are effective in limiting the risks associated with being a project manager. These are called the performance contract and planning horizons.

The performance contract is simply an explicit agreement of what the project manager and the user and management expect from each other and how they are going to work together. Though it is usually verbal, it should be committed to writing. Why not call it a working agreement? The word "contract" is useful in two ways. First, it calls attention to the need for specific actions in the relationship between the project manager and the rest of the organization. Second, the legal connotations of the word are applicable to the project manager's situation.

Contracts contain two basic elements that apply to the project manager's relationships: mutual consent and valid consideration. With mutual consent, both parties enter the agreement of their own choosing and are not coerced into working together. Valid consideration is the exchange of considerations between both parties. It is common for the user and management to express their needs and wants, but the project manager also has needs and wants that must be considered. These include:

- Access to people and information relevant to the project.
- Time to do the job properly.
- Resources to deliver a quality system in the time frame desired.

The performance contract for a project manager contains an integrated project plan, which specifies the resources and time required to deliver a system of specified quality and the assumptions

See **PROJECT** page 92

Spreadsheets get link to CPU data

WAYNE, Pa. — Unicalc Corp. has announced a data selection utility that reportedly allows users of microcomputer-based electronic spreadsheets to access data on IBM mainframe printed reports.

Dubbed Dif-Maker, the software is said to operate on any mainframe print file and convert the file into Software Arts, Inc.'s Data Interchange Format (DIF). The DIF formatting permits the interchange of data between micro spreadsheet packages such as Visicorp's Visicalc, Lotus Development Corp.'s Lotus 1-2-3, Microsoft, Inc.'s Multiplan and Sorcim Corp.'s Supercalc.

Dif-Maker reportedly enables a user to select data from any mainframe printed report by indicating the pages of the report to be used and assigning the print positions to columns on a spreadsheet.

Dif-Maker is written in Ansi Cobol and operates on IBM's MVS, MVS/XA or DOS/VSE operating systems. It is available now, priced at $2,500 for an on-site license.

Unicalc is located at Two Academy Lane, Wayne, Pa. 19087.

Generic coding: giving text files portability across systems

By Steven A. Brown
and Dean Mouscher
Special to CW‡

Computers have a substantial contribution to make in simplifying and speeding up the process of document production. But the industry has suffered from a lack of industrywide standards. Text files created for one system cannot be composed on another system because they contain, along with the text, system-specific markup coding. This coding describes to the system the typographic attributes of each section of a document — type size, typeface, page width, distance between lines, indents and so on.

The issue of making text files portable is generally referred to as generic coding, or gencode. This refers to any nonambiguous method of tagging document elements according to their intellectual, rather than typographic, attributes. The distinction is important. According to the philosophy of generic coding, for example, a document section might be marked for emphasis, but never for italics. This concept is vital to the gencode approach.

A generic coding scheme might work as follows. When a publication is entered into the data base, it could be broken into its composite data elements and each element tagged. For example, every paragraph might be preceded by "<P>," and every table by "<T>". Sections to be emphasized could be marked "<E>," with "<END>" designating the end of the section. Quotes could be preceded by "<Q>." But, consistent with the principles of gencode, quotation marks themselves would never be tagged.

The next step would be to write markup coding formats that correspond to your tagging scheme. Each tag would call a format. This is where the link between intellectual elements and their typographic attributes would be made.

The "official body" of generic coding is the Graphic Communications Association. After more than 15 years of effort, it has come up with a proposed Ansi/X3J6 standard.

After throwing out many approaches as being too restrictive, the committee agreed to standardize a language for describing rules for recognizing tags. The proposed Ansi/X3J6 standard is not a standardized markup language, standardized tagging scheme or set of rules for recognizing tags. It is simply a "metalanguage" that describes how to describe tags. The standard does contain a mechanism for registering document tagging schemes in order to encourage further standardization.

Prepress systems can be divided into two approaches — interactive and batch. Interactive systems show the user a close facsimile of the finished page. These systems are much appreciated by those who deal with custom pages. Interactive systems do not make decisions themselves — they put type into place and let the operator do the thinking.

Batch systems do not show finished type during input. Instead, they take complete text files and compose them into finished pages. A good batch pagination system will

See **GENCODE** page 92

SOFTWARE & SERVICES

SYSTEMS SOFTWARE

SOFTWORKS, INC.
VIO Plus

Softworks, Inc. has introduced VIO Plus (Vsam I/O Plus), an IBM Vsam utility that is said to reduce unnecessary I/O operations.

The VIO Plus utility reportedly improves system performance by reducing I/O operations, thus reducing CPU time, disk/channel activity and elapsed time. Elapsed time savings range up to 75%, a spokesman said.

The cost for VIO Plus is $12,500. A 36-month lease plan is available at $538 per month.

Softworks, 7700 Old Branch Ave., Clinton, Md. 20735.

APPLIED INFORMATION DEVELOPMENT, INC.
Version 2.0 of JCLWTR

Applied Information Development, Inc. has introduced Version 2.0 of its JCLWTR System Software product.

The product, designed to manage the retrieval and storage of JCL Sysout listings, eliminates printing and filing of JCL listings and supports Datagraphix, Inc.'s Microcom and Kodak Corp.'s Komstar interface to computer-output microfilm (COM), plus an off-line interface for COM service bureaus, the company said.

The new version includes generic retrieval by subsystem; automatic scan of JES (Job Entry Subsystem) messages for exceptional conditions; an expanded exit facility; support for IBM's Roscoe and TSO/SPF interfaces; expanded microfiche control; improved customization features; and support for IBM's JES 3. JCLWTR is priced at $7,500 for a one-time license fee.

Applied Information Development, 823 Commerce Drive, Oak Brook, Ill. 60521.

JMS SOFTWARE, INC.
DYLOG/TCT

JMS Software, Inc. has introduced a software product that reportedly reduces the static storage requirements of the IBM CICS Terminal Control Table (TCT) by allocating only the storage capacity needed for terminals actually in use.

The product, Dylog/TCT, reportedly reduces the storage needs on the CICS/VS region in large terminal networks by 1M byte or more. It also reportedly eliminates the need to bring the CICS region down when reconfiguring the network.

Dylog/TCT is said to operate on any IBM computer that supports CICS and operates within any CICS/VS region using release 1.5 or later. Dylog/TCT is leased for a one-time fee of $16,500 for IBM OS systems and $11,500 for IBM DOS systems, on a single CPU basis.

JMS Software, Suite 7967, One World Trade Center, New York, N.Y. 10048.

GREENE SOFTWARE
Queue/36

Greene Software has introduced Queue/36 for IBM System/36 users.

According to the vendor, Queue establishes an auxiliary batch job queue that allows user jobs to run independently of and concurrent with jobs in the System Job Queue.

No modifications are required with Queue/36. Users have control of their job's position in the queue, status, start time, execution priority and completion messages through interactive screens. A one-time license fee for the product is $295 per CPU.

Greene Software, P.O. Box 23, Victor, N.Y. 14564.

PRODUCTIVITY AIDS

MARATHON SOFTWARE AND SERVICES, INC.
Mudsam on UFO/CICS

Marathon Software and Services, Inc. has announced its UFO Documentation System and More (Mudsam) for users of Oxford Software Corp.'s UFO/CICS software on IBM mainframes.

The software produces a system documentation index for UFO programs and generates multiple listings of program components in a single pass. It also flags program code that wastes memory and response time.

Mudsam is available for UFO/CCS releases 2.4, 2.4.1,

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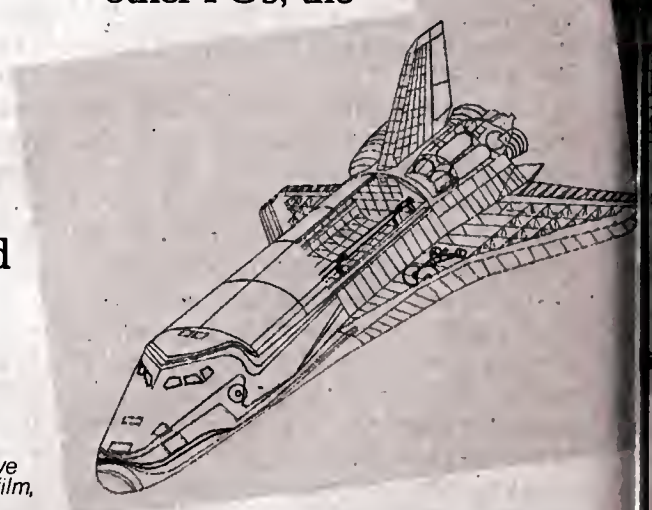
But it's no accident. It starts with the NEC 7220 graphics processor, the most advanced graphic chip available.

Then, unlike other PC's, the

Graphics are being used more and more by businesses every day. They give companies a clearer picture of their place in the market. They make for more effective presentations. And with slides and color transparencies, they can let a room full of people see the same thing at once. Although most people see the value of graphics, very few are aware of the personal computer that lets them create the best color graphics.

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Context MBA is a trademark of Context Management Systems. Inc. Graphwriter is a trademark of Graphic Communications, Inc. Graphplan is a trademark of Chang Labs, Inc.

SOFTWARE & SERVICES

2.4.2. It is priced at $500.

Marathon Software and Services, 145 Porter Ave., Bergenfield, N.J. 07621.

APPLICATION PACKAGES

PLYCOM SERVICES, INC.
Fixed Assets System

Plycom Services, Inc. has announced the Fixed Asset System for use with Digital Equipment Corp.'s VAX-11 processors under DEC's VMS operating system.

A spokesman said the Fixed Asset System features screen-formatted data entry, on-line file maintenance, an edit log of all master file changes and automated period and year-end closing procedures. A variety of reports allow reporting of depreciation, acquisitions, disposals, transfers and audits.

The spokesman said the system can handle up to three complete sets of books for internal, state and federal reporting and can accommodate multicompany or multidivision corporate structures. It is written in VAX Basic using standard file and data structures. Prices for the system range from $1,500 to $14,000.

Plycom Services, Suite 150, 4243 Piedras E., San Antonio, Texas 78228.

DATA DESIGN ASSOCIATES, INC.
Financial systems for IBM IMS/DC

Data Design Associates, Inc. has announced versions of its general ledger, accounts payable/purchase control and fixed-asset accounting systems for the IBM IMS/DC environment.

According to the vendor, the versions provide on-line processing capability for IBM 370 series users, running under IBM's OS operating system. The system also runs under IBM's CICS.

The IMS/DC on-line version of the general ledger system is priced from $87,000, the accounts payable/purchase control system starts at $57,000, and the fixed-asset accounting system starts at $49,000.

Design Data Associates, 1279 Oakmead Pkwy., Sunnyvale, Calif. 94086.

COMPINFO, INC.
Moneypack

Compinfo, Inc. has introduced a portfolio management system called Moneypack for use on the Wang Laboratories, Inc. VS series of computers. Moneypack is said to be an on-line, interactive package that integrates trading, accounting performance and appraisal functions.

Among Moneypack's features are tax reporting, including tax lots going long-term; management retrieval; cross-referencing; trade entry; trading; and billing, the vendor said.

Moneypack is reportedly menu-driven and includes an on-line help feature. Security is available at both the functional level, for reports and screens, and the individual account level.

Moneypack is available in a price range from $40,000 to $60,000, depending on options.

Compinfo, 1860 Broadway, New York, N.Y. 10023.

MINCRON SBC CORP.
Hardgoods Distribution System

Mincron SBC Corp. has introduced a software package designed for wholesale distributors that use an IBM System/38 mainframe.

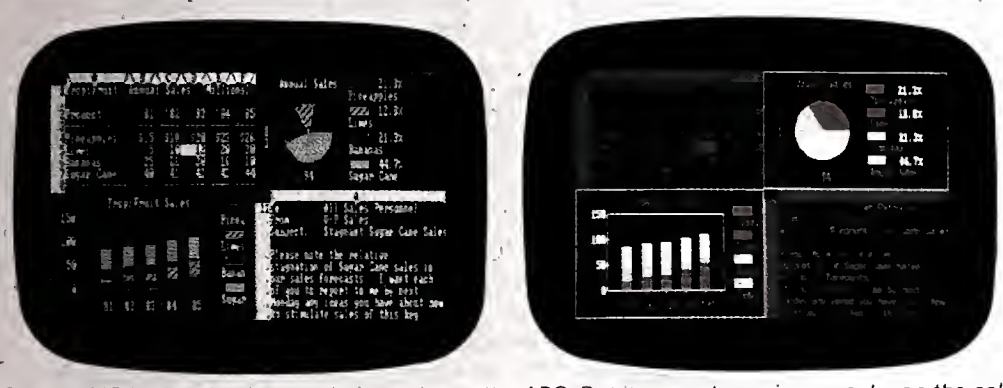
The Hardgoods Distribution System handles accounts payable, accounts receivable, order processing, inventory control, purchasing and sales analysis, a spokesman said. The package's menu-driven design is said to consolidate functions to enable a user to handle cash or credit sales, deliveries or will-calls and exchanges or back orders from the same screen. Orders can be entered by using the manufacturer's product number or the company's generic code or by passing a wand over the bar code printed next to each product in the company's catalog, the spokesman said.

The modules allow all product codes, the chart of accounts, branch codes, three-level stock locations, salesman codes and sales territories to be user-defined.

The modules are grouped in three ways — financial, purchasing and distribution — with prices ranging from $25,000 to $50,000. Dis-

Continued on page 80

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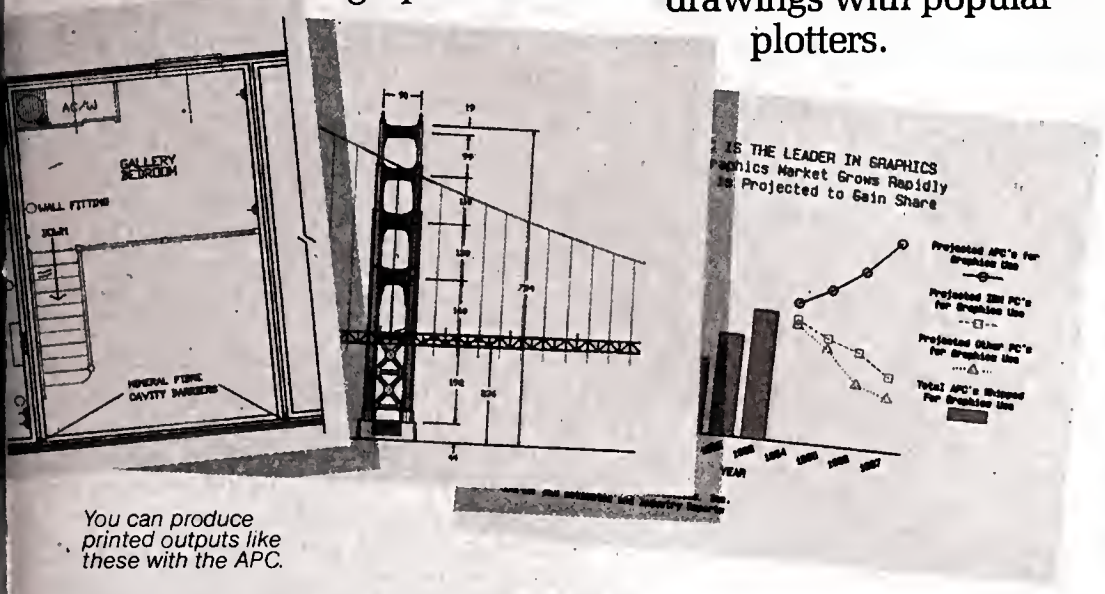
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NEC Information Systems, Inc. 1414 Mass. Ave. Boxborough, MA 01719

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SOFTWARE & SERVICES

Continued from page 79

counts are available for purchase of the full package, the vendor said.

Mincron SBC, Suite 2810, 350 Fifth Ave., New York, N.Y. 10118.

LLOYD BUSH
Simple Basic; Model version

Lloyd Bush has announced that its Simple Basic personal computing software is now available for Prime Computer, Inc. computers and Digital Equipment Corp. VAX-11 and Rainbow computers.

Also announced was a new version of Model, Lloyd Bush's planning and analysis system, for the Hewlett-Packard Co. HP 3000.

Simple Basic products, which come with a built-in full screen prompter, were designed to help overcome the initial anxieties of the personal computing novice, the vendor said. Simple Basic is said to be an implementation of the Model Decision Support application building language.

Simple Basics Budgeteer costs $6,900 for most DEC and Prime hardware, $3,500 for Prime P2250s and P250s and $595 for DEC Rainbows. The Generalist costs $4,900 for most DEC and Prime models, $2,500 for P2250s and P250s and $395 for Rainbows. Prices for the VAX-11/730 begin at $2,500.

As an introductory offer, any Simple Basics order received by July 23 will receive a 20% discount.

A Simple Basics product line for the HP 150, reportedly upwardly compatible to Model on the HP 3000, is priced from $395 to $995. New release pricing of Model (starting at $9,000) is available until Aug. 24, with discounts of 30% to 50% and a free HP Image interface for large configuration orders.

Lloyd Bush, 165 William St., New York, N.Y. 10038.

MCBA, INC.
General Ledger

MCBA, Inc. has announced a general ledger package written in Cobol for Digital Equipment Corp. VAX-11 processors.

The MCBA package, called General Ledger, reportedly offers a built-in report generator and allows adjustments to future and prior periods to be made. It is also said to allow account inquiries via terminals and to permit consolidation of statements from multiple companies.

The product is licensed for the following DEC systems at the following prices: Micro VAX-11, $2,000; VAX-11/730, $3,000; and VAX-11/750 and VAX-11/780, $4,000.

MCBA, 2441 Honolulu Ave., Montrose, Calif. 91020.

WESTMORELAND SYSTEMS, INC.
Enhancements to Calendar Scheduling System

Westmoreland Systems, Inc. has enhanced its Calendar Scheduling System for the IBM System/36. The enhancements reportedly include the addition of reminder dates and messages and the addition of help text to aid users.

The Calendar Scheduling System reportedly maintains and prints a tickler file and schedules appointments and messages by date and user. It can be used to track group projects for individual scheduling and is priced at $300.

Westmoreland Systems, Suite I, 228 Park Ave. N., P.O. Box 2726, Winter Park, Fla. 32790.

PAYMENT SERVICES GROUP
Continuous Information Exchange

Payment Services Group has introduced a software system that reportedly provides electronic cash management and funds transfer services between banks, corporations and the Automated Clearing House.

The system, called the Continuous Information Exchange (CIX), reportedly operates in a manner similar to a time-sharing system with settlement capability and is said to provide a bridge between traditional paper transaction processing and electronic processing.

Operating in either on-line or batch mode, CIX reportedly permits corporate treasurers or credit managers to access data on the bank's mainframe to conduct fund transfers. CIX runs on IBM 4300, 370 and 30 series computers.

The CIX software is priced at $60,000 for batch-mode operation. Additional software to conduct on-line operations is priced at $30,000.

Payment Services Group, 230 E. Main St., Branford, Conn. 06405.

CHASE DECISION SYSTEMS
Bankplan2

Chase Decision Systems has introduced a strategic planning software program for banks that operates on a variety of IBM or compatible mainframes under IBM's VM/CMS operating system.

Bankplan2 reportedly can simulate the financial effects of an acquisition, using either purchase or pooling methods of accounting. The package is for banks considering the financial impact of alternative investment strategies, deal structures, regulatory policies and economic conditions before making an acquisition decision, a vendor spokesman said.

The software simulates the combination of two bank holding companies, two commercial banks or a bank holding company and a commercial bank, the spokesman said.

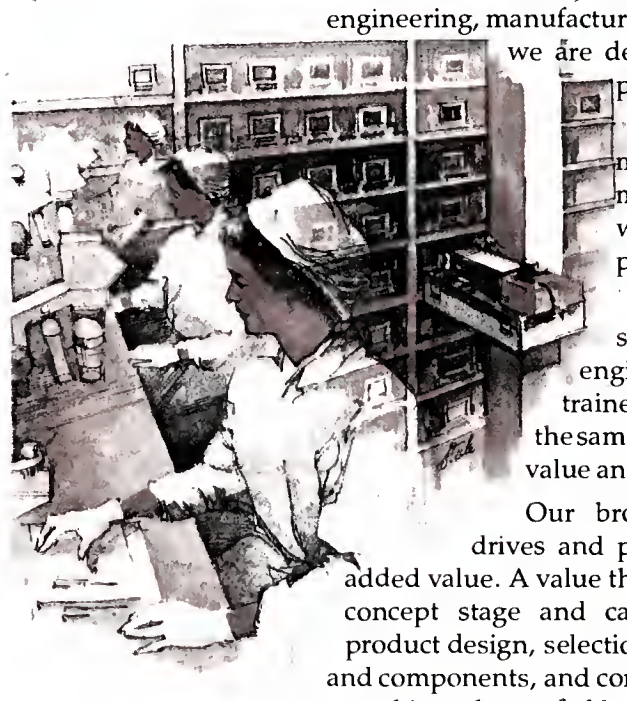
A permanent license for Bankplan2 is priced at $25,000; a monthly lease also is available.

Chase Decision Systems, 1000 Massachusetts Ave., Cambridge, Mass. 02138.

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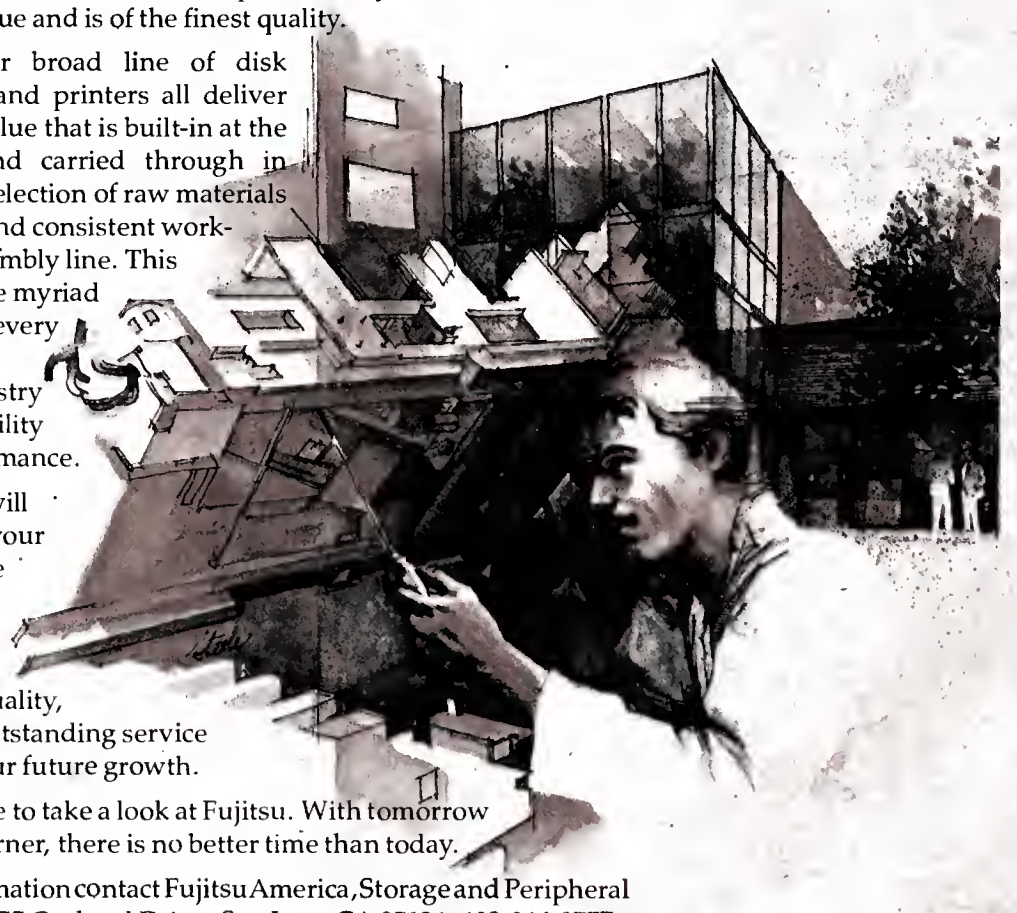
In today's information revolution there is one company well worth watching. A company which brings experience and expertise to the development, manufacture, marketing and support of OEM and consumer computer peripheral products in America. That company is the Storage and Peripheral Products Group of Fujitsu America. And through continued expansion of engineering, manufacturing and marketing facilities in the United States, we are dedicated to sustain our position of delivering products of unequaled quality and value.



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SOFTWARE & SERVICES

INTERACTICS, INC.
Home Builders

Interactics, Inc. has announced a software package for home construction firms that runs on Prime Computer, Inc. 50 series computers.

Home Builders reportedly offers cash forecasting, "what-if" job estimating, loan control, budget control with variance tracking, cost and control by building stage, purchasing, general ledger, accounts payable and complete audit control. Written in standard Cobol, the on-line package provides hard-copy reporting as well as real-time inquiry functions.

Home Builders costs $19,000 for a perpetual object code license; the source code is optional and is priced at $19,000.

Interactics, 7203 Marisol Drive, Houston, Texas 77083.

OAK SOFTWARE, INC.
Interface to Ecom

Oak Software, Inc. has announced that its Word Processing System for the IBM System/34, System/36 and System/38 has been enhanced to provide an interface with the U.S. Postal Service's Electronic Computer Oriented Mail (Ecom) system.

With the Ecom feature, a spokesman said, users can create messages using text entered and stored as a regular document in the Word Processing System and can use addresses entered and stored in the system's Customer File for destination addresses.

Also, the feature allows users to use a user-created file in the Ecom format for destination addresses and to key destination addresses on-line in the Ecom format.

The Word Processing System sells for $2,500 for the System/34 and System/36 and $3,500 for the System/38. The Ecom feature is priced at an additional $500.

Oak Software, Suite 215, 300 S. Duncan Ave., Clearwater, Fla. 33515.

3M CO.
Crimestat

A report generator for police applications has been announced by 3M Co. for use with its Micrapoint II hard-disk micrographic filing system. Called Crimestat, the software automatically prints uniform crime reports onto Federal Bureau of Investigation forms.

The Crimestat software reportedly is able to predict the number of calls a police agency will receive in the coming month by using an algorithm with a margin of error of 10% or less to interpret the previous month's projection. A date report feature reportedly prints a call rate history by district for any day of any month, including the average number of calls per day for that month.

Crimestat is also said to be able to produce on demand a current list of wanted persons, including juveniles and those wanted for questioning, and wanted vehicles. It licenses for $4,809.

3M, P.O. Box 33600, St. Paul, Minn. 55133.

IBM
3680 restaurant management program

IBM has introduced a restaurant management program for use with its point-of-sale terminals. The program is designed for use with IBM Model 3680 programmable store system equipment, including the IBM Model 3684 point-of-sale terminal/controller unit and the IBM Model 3683 point-of-sale terminal.

It reportedly can generate 23 reports, including sales, labor costs, menus and food and beverage inventory. It is capable of either standalone use or network connection.

The 3680 program provides payroll information in automated form for processing by payroll departments. Information recorded includes employee time and attendance, tips and up to four job codes for employees whose work involves multiple wage rates, a spokeswoman said.

Sixteen different menus reportedly can be stored in the 3680, with two in use at a time, enabling the system to automatically process orders entered by servers. The program can track 99 raw products and provide reports based on predetermined usage of each product.

A one-time license fee for the 3680 restaurant program is $1,000. It will be available in April 1984.

IBM, 900 King St., Rye Brook, N.Y. 10573.

DESK TOP FINANCIAL SOLUTIONS, INC.
DT/FPS for VS

Desk Top Financial Solutions, Inc. has announced a version of its Desk Top/Financial Planning System (DT/FPS) for Wang Laboratories, Inc. VS series of small business computers.

The Wang VS version of DT/FPS is fully compatible with currently installed Wang OIS systems.

DT/FPS for VS systems reportedly supports data bases as large as 500 columns by 100,000 lines. It also allows concurrent manipulation of several data bases for consolidation and selective extraction of data.

DT/FPS operates with VS workstations with 32K bytes of memory. It requires 700K bytes of disk storage and is written in Wang VS Basic. Price ranges from $4,750 to $9,500.

Desk Top Financial Solutions, 407 Main St., Spotswood, N.J. 08884.

CAE SYSTEMS, INC.
Hilo-2 on CAE 2000

CAE Systems, Inc. has announced the Genrad, Inc. Hilo-2 high-speed

Continued on page 84

DAISYWHEEL • DOT MATRIX • THERMAL

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In daisy technology, Fujitsu's SP830 is the fastest letter quality printer in the industry at 80 CPS. Fujitsu's SP320 daisywheel printer also provides cost effective letter quality printing at medium speeds. Fujitsu offers thermal printing with its TTP16 printer. The low-cost printer accepts a wide variety of papers and operates quietly at less than 50 dBA.



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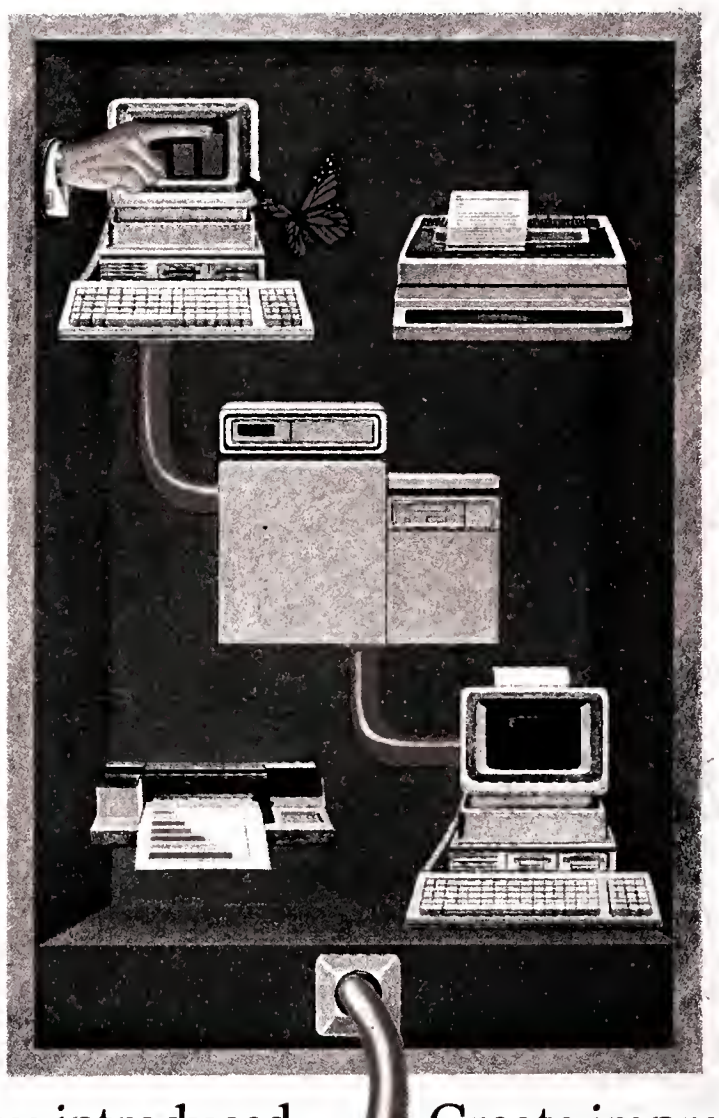
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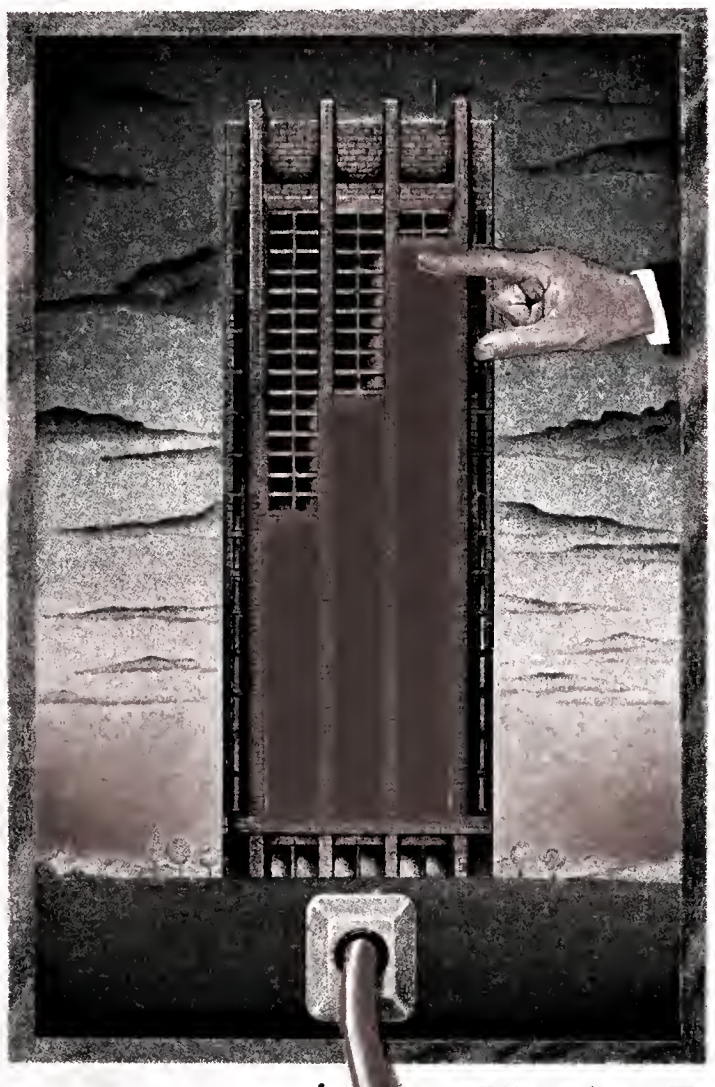
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BD02410

SOFTWARE & SERVICES

Continued from page 81

universal logic design simulator on its Apollo Computer, Inc.-based CAE 2000 computer-aided engineering workstation.

Hilo-2 is a tool for integrated board design, design verification, structural and functional modeling, detailed timing analysis, fast fault simulation and test validation. It can be used for designing chips, boards, modules or complete systems. It costs between $15,000 and $20,000.

CAE Systems, 1333 Bordeaux Drive, Sunnyvale, Calif. 94089.

SHOPPING CENTER COMPUTER SYSTEMS, INC.
Infocenter

Shopping Center Computer Systems, Inc. has announced Infocenter, a set of products for shopping center developers and managers.

The set offers accounting functions such as general ledger, financial reporting, accounts payable and payroll. The tenant accounts receivable system offers options for lease escalations, common area maintenance charges, dun letters and retail sales analysis.

Infocenter runs on Applied Digital Data Systems, Inc.'s Mentor business computers. Costs range from $9,500 to $23,500 for the complete package.

Shopping Center Computer Systems, Suite 255, 10300 Sunset Drive, Miami, Fla. 33173.

RADIAN CORP.
CPS-1

Radian Corp. has announced its CPS-1 contour plotting software on Digital Equipment Corp. VAX-11-based graphics systems sold by Intergraph Corp.

According to a spokesman for the vendor, the system was designed for geological mapping applications, allowing Intergraph computer-assisted design and manufacturing systems to create contour maps for oil/energy exploration and other specialized seismic applications.

The two versions of the contouring software include a standard version as well as a fault-contouring version.

The price of CPS-1 software on the Intergraph systems begins at $24,000, according to the spokesman for Radian.

Radian, P.O. Box 9948, 8501 Mopac Blvd., Austin, Texas 78766.

PRODUCTIVE SOFTWARE PRODUCTS
EFS Financial Calculator

Productive Software Products has begun marketing a financial software program for IBM System/36 users.

The Executive Financial Software (EFS) financial calculator program reportedly can perform calculator functions, percentage functions, amortization schedules, depreciation schedules, investment analysis of cash flow, interest calculations, lease analysis and bond analysis.

According to the vendor, EFS allows the program to ask "what-if" questions on various financial calculations. It also enables the user to switch calculations without re-entry of factors. EFS is available for $250.

Productive Software Products, 10857 Reading Road, Cincinnati, Ohio 45241.

CALIFORNIA INTERACTIVE COMPUTING, INC.
Permanent Disability Rating System

California Interactive Computing, Inc. has introduced the Permanent Disability Rating System, designed to determine permanent disability benefits for workers' compensation.

The package calculates permanent disability rating tables from a program module to facilitate the rating function and determine disability benefits, the vendor said. The system quantifies the elements of the rating and includes an override function that allows injection of subjective judgments into the rating process.

The system runs on Pick & Associates, Inc.'s Pick operating system on a variety of computers, including Honeywell, Inc.'s Level 6 Ultimate, the IBM Series 1 and 4300 series and any Prime Computer, Inc. Information series. It is priced at $11,000, the vendor said.

California Interactive Computing, 12617 Chandler Blvd., North Hollywood, Calif. 91607.

TECHNICON DATA SYSTEMS CORP.
Materials Management

Technicon Data Systems Corp. has announced inventory control for hospitals using the Wang Laboratories, Inc. VS series of processors.

Materials Management can function in a stand-alone mode or can be integrated with Technicon's Medical Information System software. It is said to increase efficiency for hospitals' inventory, purchasing, receiving and accounts payable departments through interactive files updated from many sources and shared with other files. Updated information reflects inventory levels at all points in the inventory cycle, the vendor said, and is available on-screen to all users.

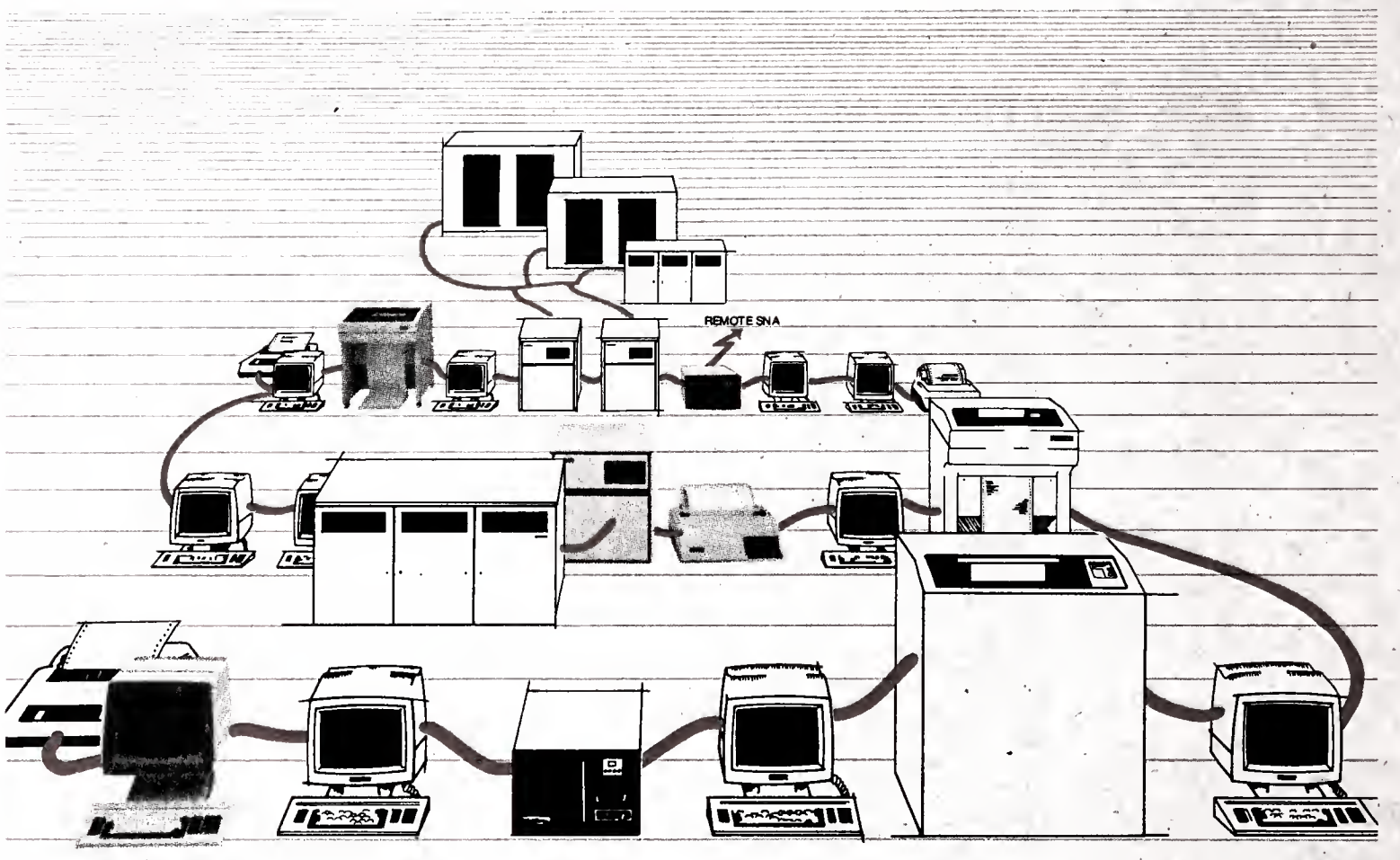
A series of standard reports are included. Automatic purchase order generation and automatic general ledger and accounts payable interfaces are also included. Materials Management is priced at $125,000 on Wang VS80 and higher systems.

Technicon Data Systems, 5885 Glenridge Drive, Atlanta, Ga. 30328.

SYSTEM DEVELOPMENT CORP.
Interface translator programs

The Stardyne Division of System Development Corp. has announced

Continued on page 86



3270 Networking: No More No Man's LAN.

Imagine. 3270 Processing. Integrated Personal Computing. Local Area Networking. And SNA Compatibility. In One System.

Imagine a system that successfully settles the uncharted territory of 3270 local networking—that "no man's LAN" of unlinked and unrealized potential.

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Imagine the economies of a system that handles that networking with standard 3270 coax. That requires no commitment to special architectures or non-standard LAN technologies. And that, thanks to a multi-drop, station-to-station design, can eliminate thousands of feet of new coax.

Of course, such a system would have SNA compatibility. But it would also have a set of capabilities to dramatically increase throughput, while reducing hardware and support cost in *any* environment. Capabilities like multi-host and multi-personality support, application and address switching, and system printing.

This system would have multi-user personal computing "built into" the network—allowing you to assign true 16-bit computing power, maintain overall MIS control and share expensive disks and printers.

Such a system would boast an intelligent display station that displays a mastery of ergonomic and aesthetic design. With multi-screen formats, anti-glare screen, low-profile keyboard, and a tilt-and-swivel pedestal with the smallest footprint in the industry. Such a system would also include a full line of printers.

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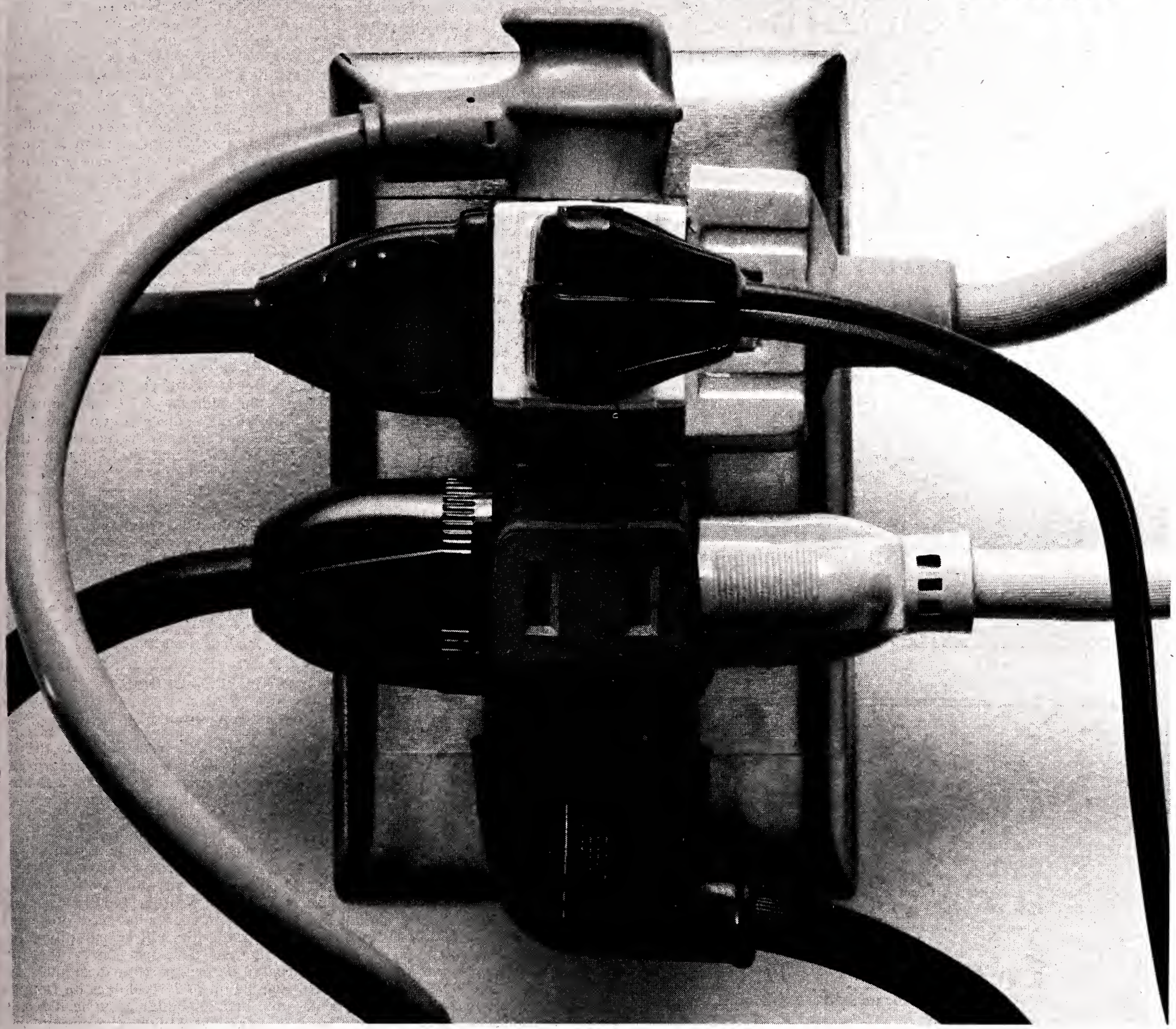
If such a system sparks your imagination, give us a call. We know the feeling. The Braegen Corporation, 525 Los Coches Street, Milpitas, CA 95035 (408) 945-8150; TWX: 910-338-7332

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SOFTWARE & SERVICES

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interface translator programs that tie together the company's Structural Analysis System and PDA Engineering, Inc.'s Patran-G.

The two translators provide three conversion options: conversion of geometry and static loadings contained on the Patran-G Neutral File to Stardyne input data, conversion of existing Stardyne input data files to Patran-G Neutral Files and conversion of the Stardyne-generated output results file to a Patran-G Neutral Results File to allow Patran-G to post-process analysis results, the vendor said.

The programs are written in Fortran 77 and can be used on Control Data Corp.'s Cyber and Cray Research, Inc. mainframes; minicomputers such as Digital Equipment Corp.'s VAX-11/780 or Data General Corp.'s MV series; and microcomputers such as those made by Apollo Computer, Inc. The price is $1,500.

Stardyne Division, System Development, Suite 3001, 360 N. Sepulveda Blvd., El Segundo, Calif. 90245.

INFO PROJECTIONS, INC.
Info System Plus

Info Projections, Inc. has announced Info System Plus, a modular mail-order processing package dedicated to interpreting market trends.

The system is menu-driven and is available for installation on the IBM System/34 and 36. Some of the product's applications include on-line order processing, on-line customer service, inventory and back-order control, sales and media analysis, list maintenance, returns system, physical inventory system and hold system, the vendor said.

The package provides custom format for invoices, back-order cards, list maintenance and four-up labels. The price is $24,000.

Info Projections, P.O. Box 3369, Evergreen, Colo. 80439.

SHLAES & YOUNG INFORMATION SYSTEMS, INC.
Creams and Ream enhancements

Shlaes & Young Information Systems, Inc. has announced a series of enhancements to its real estate software systems for the Wang Laboratories, Inc. 2200 series minicomputers.

The vendor said the enhancements to the Comprehensive Real Estate Asset Management System (Creams) and the Real Estate Analytical Models (Ream) packages were designed to improve ease of use, add analytical capabilities, provide additional reporting capabilities and respond to changes in the way leases are written on commercial properties.

Menus were redesigned to reduce their number and to permit movement through the systems with fewer keystrokes. The packages now also offer the user a choice of tenant-by-tenant market rent data entry or a global creation or update facility.

The Creams package is priced at $36,000, and the Ream package is priced at $9,000.

Shlaes & Young Information Systems, 405 N. Wabash Ave., Chicago, Ill. 60611.

ADAGE, INC. INTERMETRICS, INC.
Sphere-3000

Adage, Inc. and Intermetrics, Inc. have announced a three-dimensional, molecular display package for use with Adage 3000 Color Raster Systems on Digital Equipment Corp. PDP-11 and VAX-11 series processors.

Sphere-3000 reportedly is organized as a Fortran-callable set of subroutines providing real-time display of color, three-dimensional, space-filling models of complex molecules up to 700 atoms. It is said to include full hidden-surface removal, shading, clipping and joystick-controllable rotation and pan and zoom functions. Initial object license price for Sphere-3000 is $20,000. Source license price is $75,000.

Adage, One Fortune Drive, Billerica, Mass. 01821.

WEISS ASSOCIATES, INC.
DIF added to Venture

Weiss Associates, Inc. has announced the addition of a Software Arts, Inc. Data Interchange Format (DIF) file interface to its Venture business planning software.

The addition of DIF file support reportedly enables Venture users to move their data from Venture to other programs that also support DIF files. Once the data is moved to another program, the user can make changes and transfer some or all of the changed data back into Venture.

The Venture program with the new DIF file facility costs $495. It operates on IBM's Personal Computer, Personal Computer XT and compatible systems.

Weiss Associates, 127 Michael Drive, Red Bank, N.J. 07701.

SUPEREX BUSINESS SOFTWARE
Energy Accountant

Superex Business Software (SBS) has announced a package that tracks energy conservation efforts and operates on IBM Personal Computers or compatible systems.

The Energy Accountant reportedly takes two to five minutes of work to enter and produce reports. It accommodates any fuel sources; normalizes for weather, facility size and changes in energy systems; prorates fuel and utility bills to monthly consumption; develops energy targets based on past performance; and can handle up to 75 buildings on floppy disk and 200 buildings on hard disk.

Priced at $1,000, the system includes a variety of management reports and problem-alerting features.

SBS, 151 Ludlow St., Yonkers, N.Y. 10705.

SUMMAGRAPHICS CORP.
Parpac

Summagraphics Corp. has introduced a printed-circuit board design automation package called Parpac for use on its computer-aided design (CAD) systems.

Parpac is reportedly capable of automatically placing digital and analog components, pin arrays, chip carriers and discrete components. It also can reportedly override the automatic placement at any point to preplace certain components manually or interactively.

The product also is said to be able to produce net error and spare element lists, parts lists and connector summaries. It also reportedly includes complete documentation capabilities to produce fabrication and as-

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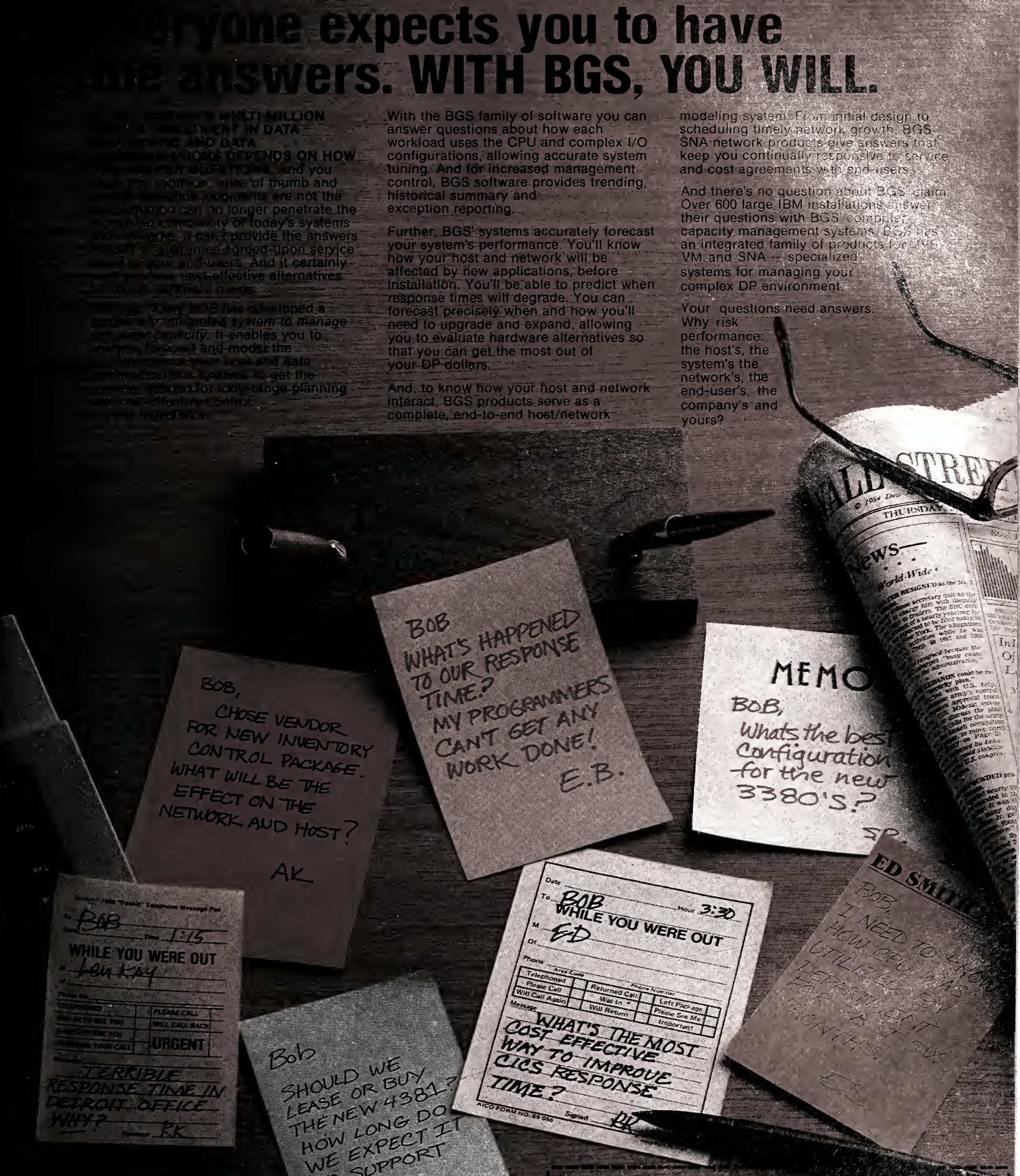
With the BGS family of software you can answer questions about how each workload uses the CPU and complex I/O configurations, allowing accurate system tuning. And for increased management control, BGS software provides trending, historical summary and exception reporting.

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And, to know how your host and network interact, BGS products serve as a complete, end-to-end host/network modeling system. From initial design to scheduling timely network growth, BGS SNA network products give answers that keep you continually responsive to service and cost agreements with end-users.

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SOFTWARE & SERVICES

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sembly drawings, drill schedules, silkscreens and solder masks.

Parpac is available for the Summagraphics Icon Series CAD system and for the firm's Summadraft hardware at a base price of $40,000.

Summagraphics, P.O. Box 781, 777 State St. Ext., Fairfield, Conn. 06430.

INTERNATIONAL TECHNOLOGY MARKETING, INC.
CAD/CAM service

International Technology Marketing, Inc. (ITM) has announced a service that provides in-depth information on the computer-assisted design and manufacturing (CAD/CAM) industry.

According to ITM, the service helps companies track industry trends and growth and provides financial and technical product data for more than 50 CAD/CAM system, hardware and software vendors.

Subscriptions to the service include unlimited use of the vendor's telephone information service, an annual report with interim supplements and a three-day seminar.

Corporate annual subscriptions are available at a cost of $12,000. Secondary company annual subscriptions cost $6,000 each.

ITM, 120 Cedar St., Wellesley Hills, Mass. 02181.

THE BRIDGE, INC.
Release 2.1 of Trak

The Bridge, Inc. has enhanced its Trak on-line project management system for IBM mainframes to include an additional level of security, a new project subdivision, the abiltiy to create new projects and activities by copying existing data and extended capabilities for automatically calculating costs.

The new security allows project leaders to create projects and perform maintenance but prevents them from maintaining tables. An intermediate level called Phase has been added between project and task. Phase records and totals are automatically generated and maintained. When new projects are created by copying an existing project, all estimated and actual costs are automatically zeroed, and activities can be copied to create the activity codes for a new department. Estimated task costs are now automatically calculated. If the estimated costs for a task are left blank, Trak is said to multiply estimated hours by a responsible employee's rate.

The software costs $9,500 on IBM's DOS operating system and $16,500 on IBM's MVS operating system.

The Bridge, 199 California Drive, Millbrae, Calif. 94030.

DATA BASE MANAGEMENT SERVICES

VISTA COMPUTER, INC.
Datascan enhancement

Vista Computer, Inc. has enhanced its Datascan data base software to include a cross-tabulation feature that reportedly permits users to create singularly changeable and individualized cross-tabulations.

The cross-tabulation feature is said to permit creation of comparative tables from any subset of the data base with no need to work with the entire data base.

The enhancement can reportedly deal with 250,000 records and hundreds of data fields. It is available for $20,000 for Data General Corp. Nova and Eclipse series processors and $25,000 for DG's MV series computers under AOS/VS.

Vista Computer, 85 Executive Blvd., Elmsford, N.Y. 10523.

NDX CORP.
Creatabase

NDX Corp. has announced a new price schedule, including some decreases, for perpetual licenses of its Creatabase data base management software. It also has established a monthly rental plan to introduce Creatabase.

The new prices for perpetual licenses of the Creatabase software, listed with the systems on which the product runs, are: Sperry Corp. Univac 1100/40, 1100/60, 1100/70, $35,000; Univac 1100/80, $45,000; Control Data Corp. Cyber 176 and 875, $50,000; CDC Cyber 175 and 170/750, $35,000; Cyber 170/760, $40,000; IBM 4341 series, $25,000; 3080 series,



SOFTWARE & SERVICES

$45,000; 3030 series, $35,000; Hewlett-Packard Co. HP 3000 System 3, $10,000, and HP 3000/64, $20,000; Wicat Systems, Inc. System 150, $2,500; Systems 200 and 220, $5,000; Cray Research, Inc. 1/M, $75,000, and X-MP, $95,000.

Perpetual licenses are available for Tandem Computer, Inc. Non Stop and Non Stop II computers, with pricing based on their number of CPUs. Prices begin at $15,000 for two CPUs and range to $50,000 for 16 CPUs. Monthly rentals of Creatabase range from a low of $150, for use on a Wicat 150, to a high of $4,750, for a Cray X-MP, the vendor said.

NDX, 8260 Greensboro Drive, McLean, Va. 22102.

SIGNAL TECHNOLOGY, INC.
Smartstar 30-day trial

Signal Technology, Inc. is offering 30-day trial packages and dial-in demonstrations of its Smartstar integrated data management software. Smartstar reportedly consists of two fourth-generation software productivity tools, Smartdesign and Smartquery.

Smartdesign is the system's applications designer and Smartquery is the fourth-generation query program for execution of those applications, according to the vendor. The Smartstar software will reportedly run on any Digital Equipment Corp. computer under the VMS operating system.

The 30-day trial package for Smartstar is available for $200 and includes a set of documentation, a nine-track magnetic tape and demonstration materials for VAX/VMS 3.1. The price of the trial package will reportedly be refunded if Smartstar is purchased within 60 days. The Smartstar dial-in demonstration is available over phone lines from the vendor's computer system.

Smartstar is available for the following computers at the following prices: VAX-11/730, $4,000; VAX-11/750, $5,600; VAX-11/780, $7,000; and VAX-11/782, $7,000.

Signal Technology, 5951 Encina Road, Goleta, Calif. 93117.

VALUE COMPUTING, INC.
IDMS Accounting Subsystem

Value Computing, Inc. has announced the IDMS Accounting Subsystem, which produces performance and accounting reports and provides utilization statistics for users of Cullinet Software, Inc.'s IDMS data base management system.

The system reportedly extracts data from the IDMS log and reports IDMS internal task and transaction activity, external run units for batch programs and for tasks executing in another region and terminal activity. It includes an interface to Value's Comput-a-Charge data center accounting and billing system.

The system runs on the IBM 370, 30 series and 4300 series processors under IBM's DOS/VSE, VS-1 and MVS operating systems, according to the vendor.

The purchase price is $5,000. A 12-month lease is available for $460 per month.

Value Computing, 498 N. Kings Highway, Cherry Hill, N.J. 08034.

LANGUAGES

CLARITY CONCEPT SYSTEMS CO.
Enforcer I

Clarity Concept Systems Co. has introduced Enforcer I, which is said to help data processing departments eliminate the practice of speed coding.

Speed coding, according to the vendor, occurs when programmers use too many abbreviations and too few comments in their programming. Enforcer I reportedly consists of on-site instruction provided by the vendor and a program that checks the work of programmers to warn them against speed coding as they work.

The software is said to operate during programming without interfering with the programming's progress. The software reportedly will operate on any system that supports Cobol.

Enforcer I licenses for $9,600 per year, including software and orientation instruction. For installations outside New York, users must provide travel expenses

Continued on page 90

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High Touch™ Style You'll Prefer.

This new generation of Lear Siegler video display terminals brings elegant High Touch™ style to our American Dream Machine (ADM™) tradition. The family features three new ergonomic terminals designed to meet the needs of OEMs and end users alike: the ADM 11, the ADM 12 and the ADM 24E.

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Lear Siegler's new VersaPrint™ 500 Series printers combine with Lear Siegler video display terminals for hard copy output.



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Non-Volatile Function Keys	Optional	Standard	Standard
Function Key Legends on 25th Line	From Host	From Host	Standard Non-Volatile
No. of Pages of Display Memory	1	2	2 or 4
Display Memory Configurations (Plus 25th Message/Status Line)	24 Lines by 80 Characters	(2) 24 x 80 or (1) 48 x 80 or (1) 24 x 158	User Definable up to 96 x 80
Scrolling	Standard Scrolling	Smooth, Jump or Horizontal Scrolling Split Screen	Smooth or Jump Scroll Split Screen
Transmission Mode	Conversation Mode	Conversation or Block Mode	Conversation or Block Mode
Editing	Limited	Full Editing & Protected Fields	Full Editing & Protected Fields
Visual Attributes: Reduced Intensity, Blink, Blank and Reverse Video. Underline also on ADM 12 and ADM 24E	3 Embedded 1 Non-Embedded	4 Embedded, 1 Non-Embedded or All Non-Embedded, plus Full Screen Reverse Video	5 Embedded, 1 Non-Embedded or All Non-Embedded, plus Full Screen Reverse Video and Highlight
OEM Flexibility	Modifiable Set-Up Characteristics	Modifiable Set-Up Characteristics & Personality	Modifiable Set-Up Characteristics. Add to Program in ROM or Down-Line Load in RAM (56K ROM or RAM. Up to 22K Display Available) Room for additional Logic Boards.
Terminal Compatibility	ADM 3A, ADM 5, ADDS Viewpoint & Regent 25, Hazeltine 1400, 1420 & 1500, DEC VT-52	ADM 3A, ADM 5, ADM 31, ADM 32	ADM 3A, ADM 5, ADM 31, ADM, 32, ADM 42

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SOFTWARE & SERVICES

Continued from page 89
for a Clarity Concept Systems instructor.

Clarity Concept Systems, 14 Washington Place, New York, N.Y. 10003.

HARRIS CORP.
Harris C; VHIL

The Computer Systems Division of Harris Corp. has announced the addition of Harris C, a compiler for the C programming language, and VHIL (VOS Harris Implementation Language), an added-function C enhancement. Both are available for use on Harris superminicomputers.

A full implementation of the C language, Harris C is said to be compatible with other C compilers. Designed for extensive porting ability, Harris C reportedly performs record I/O, the Harris VOS I/O and byte-stream I/O.

The shared common-area interface on Harris C permits it to operate with Fortran on the same data, according to the company. Using this interface, programs can be written in both languages.

Other features include error checking and automatic error recovery, data checking and debugging.

Offered with Harris C for further program development uses, Harris' VHIL compiler is an extended version that is said to provide a friendlier programming environment than standard C compilers.

Harris C and VHIL compilers are available together for $7,500, with a monthly maintenance fee of $55.

Harris Computer Systems Division, 2101 W. Cypress Creek Road, Fort Lauderdale, Fla. 33309.

TOWER SOFTWARE, INC.
Sleuth

Tower Software, Inc. has introduced Sleuth, a debugging package for Cobol users on Hewlett-Packard Co. HP 3000 systems.

According to the vendor, Sleuth creates a running audit trail in an easy-to-read format. It can be displayed on a screen or printed.

Sleuth sells for $1,500 for a long-term license. Demonstration kits are available.

Tower Software, 328 15th Place, Manhattan Beach, Calif. 90266.

TARTAN LABORATORIES, INC.
C and Modula-2 compilers

Tartan Laboratories, Inc. has announced C and Modula-2 language compilers for Digital Equipment Corp. VAX-11 processors and National Semiconductor Corp. 16032-based Unix systems.

The compilers are said to provide optimized code while allowing program portability across architectures. The compilers' error diagnostics not only provide a line number and cryptic phrase for an error message, but also display the incorrect line and the ones surrounding it for context, point to the error and explain the problem and how the compiler attempts to recover from it, a vendor spokesman said.

Each compiler reportedly incorporates a tool called the Production Quality Compiler. This takes machine and language definitions and produces a compiler for specific languages on specific machines, the spokesman said.

The C and Modula-2 versions for VAX/Unix systems are priced at $2,000. Versions for 16032-based Unix systems are priced at $1,000 each.

Tartan Laboratories, 477 Melwood Ave., Pittsburgh, Pa. 15213.

SIGNETICS CORP.
C cross-compiler

Signetics Corp. has announced a C language cross-compiler that allows routines written in C to be combined or linked with routines written in the Signetics SC68000 macro assembler.

A vendor spokesman said the cross-compiler is designed for system engineers developing products based upon Signetics' SC68000 16- and 32-bit microprocessor family. The cross-compiler reportedly allows users to create programs in the most appropriate language and to manipulate hardware via the program's linking capability.

The system is said to conform to Version 7 of Unix C and to produce assembler code.

The operating environment is based upon any Digital Equipment Corp. VAX-11 processor.

The Signetics C programming language cross-compiler is available immediately at $3,400, including the C cross-compiler and the SC68000 macro assembler on ½-in. magnetic tape.

Signetics, P.O. Box 409, 811 E. Arques Ave., Sunnyvale, Calif. 94086.

REMOTE COMPUTING SERVICES

GENERAL ELECTRIC INFORMATION SERVICES CO.
Financial planning from Cali

General Electric Information Services Co. (Geisco) has announced that it will market financial planning software from Cali Computer Systems, Inc.

The Cali software reportedly includes a financial aid planning program and other Cali personal financial planning programs. The software will be downloaded to subscribers via the GE Mark III worldwide teleprocessing network and will be updated as enhancements are produced.

The Cali financial planning software runs on IBM Personal Computers and compatible machines. Subscriptions are available for $500 per machine per month, with a minimum order of 20 required.

Geisco, 401 N. Washington St., Rockville, Md. 20850.

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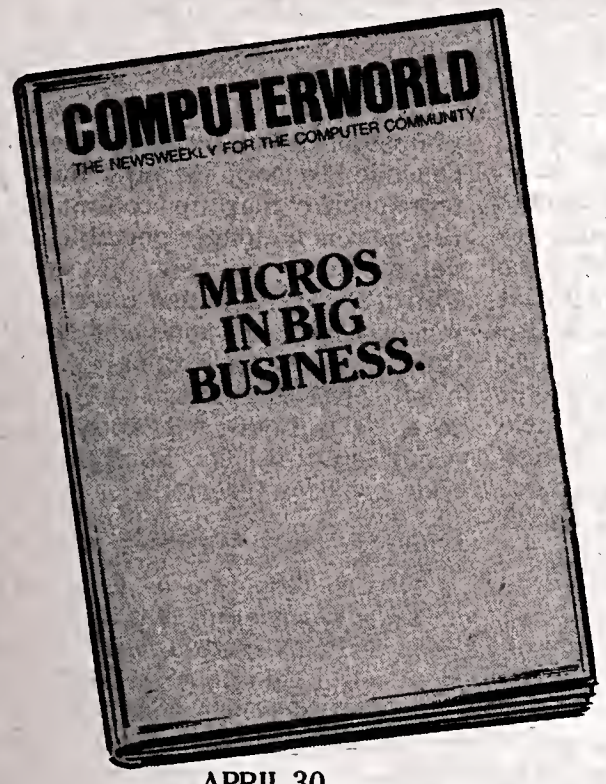
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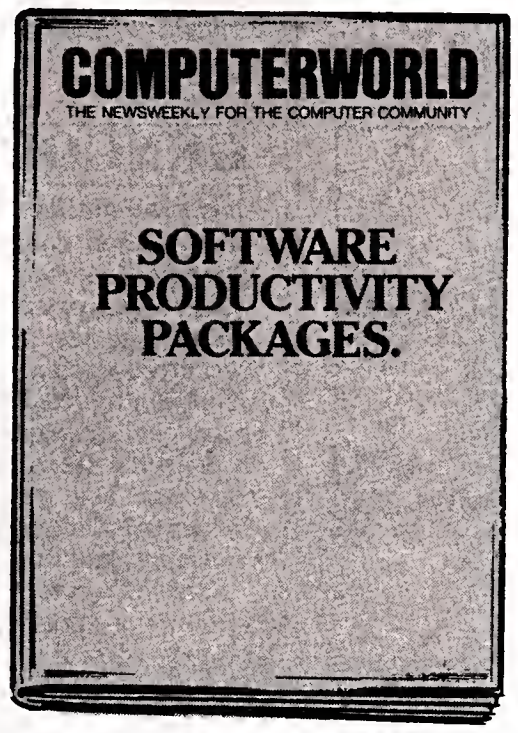
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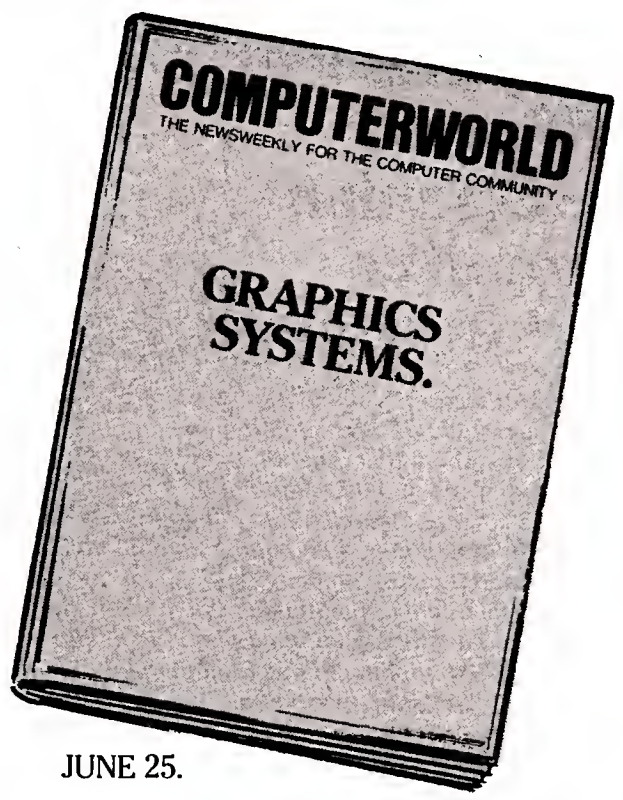
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The BiComM-3700 was developed by Wilmot Systems Inc.

Packaged Solutions INCORPORATED

GENCODE from page 77

have the ability to "learn" document styles, then compose them with no operator intervention. It takes longer on a batch system to set up the initial job of a series than it does on an interactive system. But once the style has been learned, a batch system will compose subsequent jobs with little assistance from the operator. Batch systems are good for directories, technical documentation and financial and legal documents.

Batch systems are clearly the choice for composing generically coded text files. Recall that document elements, such as paragraphs, tables and emphasis points, are coded for their intellectual, not typographic, attributes. It makes far more sense to have the computer go through the document and make it look the way it should (batch approach) than to have a human operator go through the document page by page (interactive system).

To maintain the integrity of the gencode approach, a prepress system must not require manual intervention. This spells disaster in a gencode system for a number of reasons.

Suppose the style dictates a maximum of three consecutive hyphenated lines. After composition, a proofreader notices a paragraph with four consecutive hyphens. Since the system has no provision to allow the user to specify the maximum number of hyphens, the job must be called up on the screen and a hard line ending code inserted.

We now have several problems. First, we have coded a typographic parameter into the text file that is philosophically incompatible with gencode. Second, we now have system-specific markup coding in the file, so it is no longer portable, which defeats the purpose of gencode. Third, if text is added later and the job precomposed, many of the lines following the additional text will break differently than they did before. Yet a break will automatically occur wherever the hard line break code has been inserted.

Prepress system attributes

This is only one of hundreds of stylistic parameters that may have to be specified before a complex document will paginate correctly with no manual intervention. As a result, a prepress system that can build pages without manual intervention must have two attributes.

The first is a markup language that can specify the entire spectrum of stylistic considerations. These include provisions for automatically generated headers, footers, footnotes and more.

The system also must have powerful formatting capabilities. These are necessary to make the link between tags and markup coding. Ideally, they should include in-stream processing capabilities that will manipulate text, automatically call formats, perform logical operations and so on. The importance of avoiding manual intervention cannot be overemphasized.

Brown is president of Datalogics, Inc. in Chicago and a member of the board of directors of the Graphic Communications Association.

Mouscher is Datalogics' director of marketing.

PROJECT from page 77

that went into that plan. As with any contract, both parties must fulfill their obligations if the agreement is to work.

The second method for limiting high risk in project management is the use of the phase-limited commitment based on planning horizons. One of the functions of the project manager is to predict the future: what and when things will happen on the project.

It is not unusual for a data processing project manager to be given a big project assignment that will extend far into the future. It is the foolish project manager who pretends that one can accurately predict the end of the project. In these cases, the project manager should only predict the portion of the project that can be planned with reasonable accuracy. The appropriate length of time for the project manager to plan is known as the planning horizon.

Determination of what is the appropriate planning horizon depends on the definition of the organizational environment and the nature of the project. The project manager should consider three factors when selecting a planning horizon:

- The stability of the organization.
- The precision of the project definition.
- The complexity of the project.

The stability of the organization is reflected by the frequency of reorganizations and reassignments, the employee turnover rate and the frequency in which the organization's priorities change. A planning horizon should also take into consideration how clearly defined the project's scope and objectives are. Another factor affecting the appropriate length of a planning horizon is the complexity of the project itself. The more complex a project is, the greater the risk tends to be for the entire organization, thus the greater the risk for planning the project. For more complex projects, a shorter planning horizon is appropriate.

Usually, a project manager will select a planning horizon that coincides with the phases of the system development life cycle. This concept of planning only part of a big project is known as rolling project management or phase-limited project management. The wise project manager only commits what can be reasonably planned, thus making a phase-limited commitment to management.

The concepts of the performance contract and a phase-limited commitment can help the project manager minimize the risks associated with the position. The performance contract clearly defines the responsibilities of the project manager, the user and the organization's management. The contract approach makes it easier to define where pressure should be put in order to complete the project. The phase-limited commitment of a project manager commits only to those activities which can be reasonably planned and managed. With a clearer picture of responsibilities and obligations, project managers can more easily complete their jobs.

Alexander is a consultant with The Plagman Group, Inc. in New York. The Plagman Group is a regular contributor to Softline.

IN DEPTH



Pick steps out

Comparing Pick to Unix is a nice way to start a religious war. Both have extremely loyal followings who are quick to rush to the defense of their systems. Both products also have definite, nonoverlapping strengths and weaknesses.

By Rick Cook

The operating system *Business Week* called "the computer industry's best-kept secret" won't be a secret much longer.

More than a decade after its first implementation, the Pick operating system is beginning to attract attention outside a small fraternity of devotees. And Pick Systems, Inc., the company founded by Dick Pick to promote his brainchild, is getting ready to move the product into a much larger arena.

The company will attempt to go head to head against AT&T's Unix in the mini and micro worlds and to gain more visibility and credibility in the mainframe area.

In the time that Pick has been available, it has gained a considerable underground reputation as a system for business applications. Some observers see parallels between Pick's present-day cult status and vocally loyal following and Unix's situation just before it burst into public consciousness.

In its latest effort to broaden its market appeal, Pick Systems announced a release called Pick Open Architecture; developed a coprocessor called the Vulture to speed up the system on minis and high-end micros; and brought out the system for $495 on the IBM Personal Computer XT, the hard-disk version of that machine. The company is also mapping its first major advertising campaign and planning an educational and documentation program to make Pick more accessible and easier to use. To finance all this, Pick Systems is looking for outside capital for the first time and hopes to make an announce-

ment on that score in the next 60 days.

Basic specs

Pick is a multiuser, virtual memory operating system with a built-in relational data base with a dictionary file structure. It has an English-like nonprocedural query language, a considerably extended compiled version of Basic, a stored-procedure language and a number of other high-level features. The system is optimized for business and management applications rather than scientific, engineering or systems development use.

In Pick, almost all of the details of hardware and file handling are hidden from the users and programmers. The system concentrates attention on the data and the relations among data. There are no fixed file or record lengths, for example, and files and records automatically expand or contract as data is added.

One area in which Pick excels, according to supporters, is in generating the kind of special reports that are the bane of most DP operations. Access, the Pick query language, is reportedly easy enough to use that a manager can start making his own queries with just a couple of hours' training.

To the user, it appears that the data is kept in a single mass. Relations are defined by means of items in special files called dictionaries, and they can be changed at will. To see how this works, consider the problem of converting a system from five-digit to nine-digit Zip Codes. With Pick, the task is easy. The dictionary item defining Zip Code can be called up and changed from a five-character field to a nine-character one in less than a minute. Since all dictionary items can be defined by name, the item would probably be called "zip.code."

In a well-designed data structure under Pick, the change need be made only once, because there is only one dictionary entry for Zip Code. All of the programs and procedures that use Zip Codes will reference that entry. Of course, if the user needs to maintain both five-digit and nine-digit codes, that can be done, too. The programmer would create a new dictionary item for nine-digit Zip Codes and indicate which addresses need which codes. Since each user has his own dictionary, the Zip Code size can be different for different users.

One area in which Pick excels, according to its supporters, is in generating the kind of special reports that are the bane of most DP operations. Access, the Pick query language, is easy enough to use that a manager can reportedly start making his own queries with just a couple of hours of training. Alternatively, even junior members of the data processing staff can produce complex reports quickly.

"Generally, we can get a report back to a manager within a couple of hours," says Brad Holland, a systems analyst at the Nichols Institute, a medical laboratory in San Juan Capistrano, Calif. "Some take longer, but the original analysis of the file structure that was done for our system doesn't take full advantage of Pick. Generally, in the event of a special request, we can get back to them at the latest the next day." The institute uses Pick on its Microdata Corp. 6000 and 8000 minicomputers.

Complex series of commands can be created, named and stored as procedures, or "procs," to be called and used as needed. With the appropriate procs, even relatively naive users can perform complicated operations as easily as simple ones.

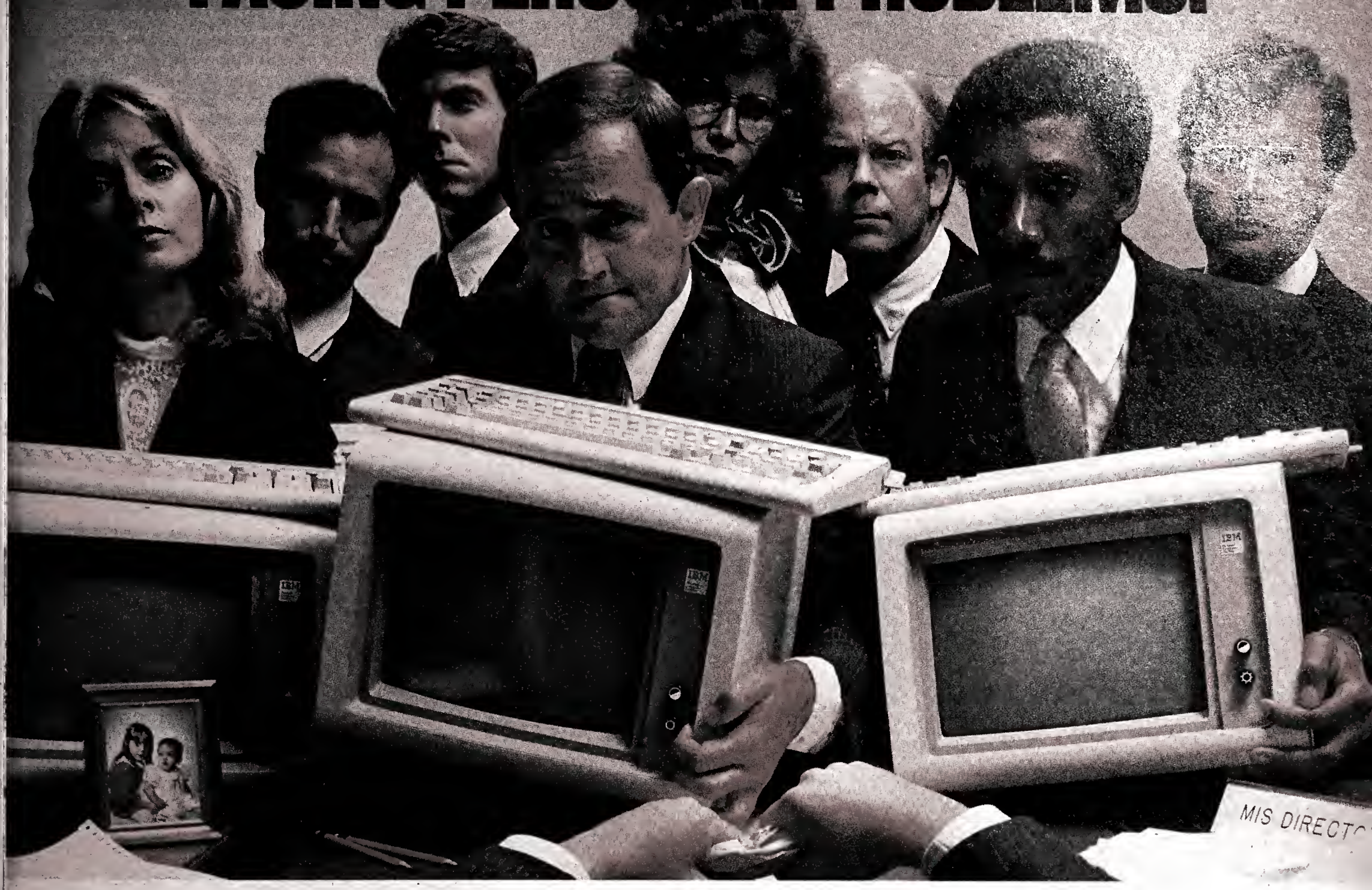
Pick dictionaries also allow users and programmers to define synonyms for dictionary items. If the user feels more comfortable calling something "electric bill" instead of "utilities," it is the work of a minute to define the terms as synonyms. This situation applies to the commands in Access as well. For the user, "list" can become "show me," or whatever. Words can also be defined as throwaways, to be ignored by Access.

This flexibility leads some users to set up their own simple form of natural language processing by replacing items and commands in their dictionary with their own words. More important, the English-like structure of the language and the ability to concentrate on the data rather than the system encourages free-ranging searches in the data base. A user can start with a general idea and follow where it leads, refining it with successive commands.

Structurally, Pick is a virtual machine entirely implemented in software or firmware. Even the memory management unit for the virtual memory is a construct. The Pick virtual machine has its own pseudo assembly language, which is rich in commands needed for data management. It also has about 600 instructions — one of the reasons that not many people try to write in Pick assembler.

The virtual machine is hooked to the hardware through a software module called the monitor. The first Pick implementations were on minicomputers, with the operating system in firmware. On microcomput-

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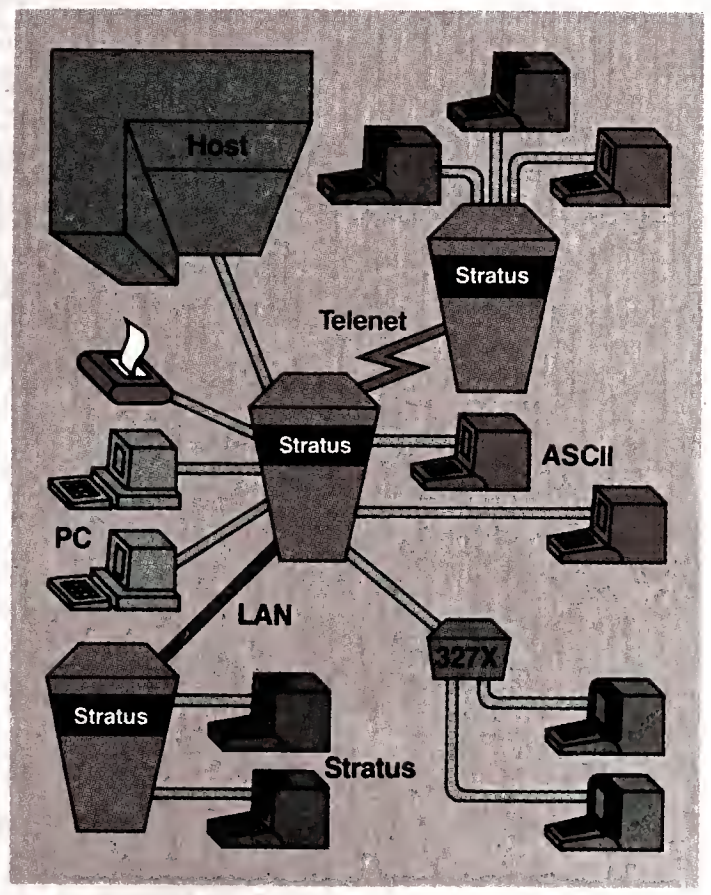
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SOS Combines Comprehensive Software and Fault Tolerant Hardware

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Here's a quick look at what you get with SOS (without having to write a single program):

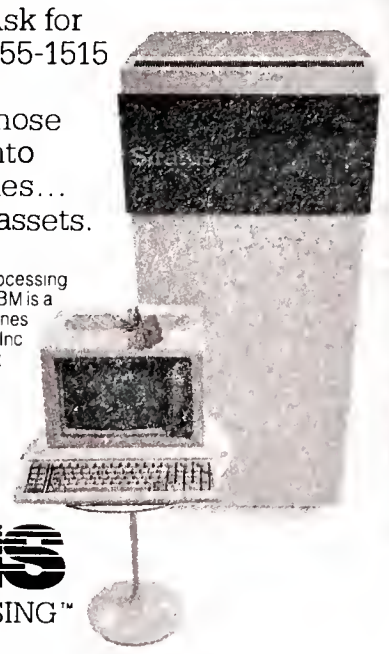
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ers, the system is in software.

The setup is complex, and getting it running efficiently on a new machine takes some doing. On the other hand, once it is running, it will run any Pick software. Because of the virtual machine design, all computers appear to be exactly the same machine to a Pick application. Programs written on a multiuser micro under Pick will normally run on a mainframe with Pick and vice-versa.

Divergence with Unix

In this respect, Pick is the opposite of Unix, as Pick supporters like to point out. Unix is a highly portable operating system, but it exists in a number of flavors, and applications written for one version of Unix won't always run on another version. There is basically only one version of Pick, so while porting Pick is more work, applications load and go.

"As Pick is portable across the hardware, we look at which hardware suits each installation and put in the same software everywhere," notes Zamir Hassan, director of information systems for Greenman Brothers, Inc., the parent company for several chains of wholesale distributors and toy and sporting goods stores with locations from Texas to New England. Hassan says the software is being developed at the company's Farmingdale, N.Y., headquarters on a Honeywell, Inc. Level 6 minicomputer with the assurance that it will run on everything from an IBM 4300 down.

Like many users, Hassan also praises the ease of applications development with Pick: "Pick Basic has a lot of power in it. The main programming language is not really Basic. I would call it very close to Pascal. If you are comparing it with Cobol, 10 pages of Cobol could be put in maybe 200 lines of code in Pick Basic. It's very easy to produce applications programs."

Because applications development is so easy, several microcomputer companies, such as Altos Computer Systems, Inc., offer Pick in addition to Unix for their multiuser systems.

According to Bob Bozeman, director of marketing at Altos, the company offers Pick in special sales situations. "You always have some customers with unique needs and you have to have a fundamental tool kit to provide unique solutions." Bozeman says Altos doesn't push Pick widely because "we are afraid of our dealers having to worry about too much."

Communications lacking

Perhaps Pick's most serious deficiency is in communications capability, particularly when compared with Unix.

"The basic thing available is standard 3780/2780 capacity," Hassan says. "That's the best you can do right now, and it limits you in designing a distributed-type system."

Pick also lacks floating-point ability. Holland says that is the reason the Nichols Institute uses another system to handle the data reduction of its laboratory tests and Pick for business functions.

"Pick is great for business, but it would be nice to run the processes of the company on Pick, too," he says.

Other common complaints about Pick are the lack of a high-level language besides Pick Basic and the fact that the system is not multitasking in the sense that Unix is. Each terminal can run only one thing at a time instead of several tasks at once, the way Unix can.

Open Architecture

Pick Systems' response to all this is Open Architecture, a series of enhancements for Pick which will offer multitasking, floating-point arithmetic, better communications and a number of other features. It also offers a 20% to 25% performance improvement, the company says. The package was formally announced at Pick Spectrum, the annual Pick get-together, last February, and it is supposed to be completely implemented in the next 18 months.

"That is the basis for the future," says Wayne Wahlenmeier, Pick Systems' vice-president of marketing. "We're opening ourselves up more and more to additional things."

Pick sees Open Architecture as a further generalization of the concepts of the operating system. "In the most simplistic terms, what Open Architecture is all about is generalizing that underlying operating system to where it is not just suited to run our system, but it can run anything — like [Microsoft, Inc.'s] MS-DOS or Cobol."

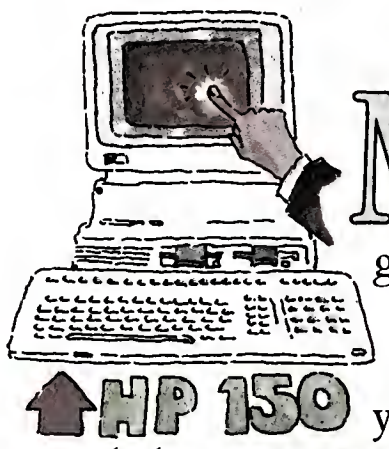
"It's the culmination of a 20-year project," Pick says, "and I'm willing now to say there is better underlying architecture for a multiuser time-sharing system than what you're looking at now." He adds that when Open Architecture and the associated tools are completed over the next year to 18 months, he will be ready to move on to new things.

Open Architecture was designed to make it easy to add other features to the system as it is developed. Among those Dick Pick wants to add are artificial intelligence features.

"If you look at what we have today, it is generalized information management. You can abstract information from the real world and

Perhaps Pick's most serious deficiency is in communications capability, particularly when compared with Unix. Users are limited in designing distributed-type systems.

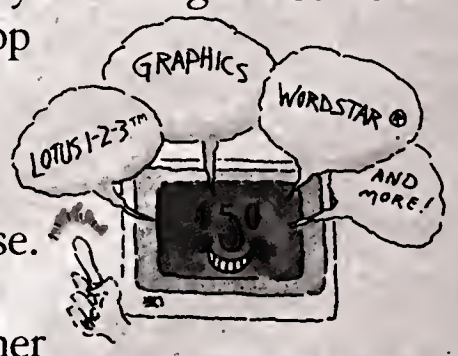
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structure it in the computer. The next big thing is what I call generalized decision management, where I can come up with some kind of a structure with which I can describe how decisions are made in terms of a man-machine interaction."

Pick also wants to add voice recognition. He points out that after the initial analysis of the waveform to get the phonemes, a process that can be handled by a dedicated microprocessor, the rest of the problem is a matter of data management.

From Girls to Pick

The basis for the Pick operating system as it exists today is the structure that Dick Pick and his co-workers developed in the mid-1960s for TRW on an Army project called Generalized Information Retrieval Language and System (Girls, later General Information Management [GIM]). The Army was looking for some method of managing the information flow in complex projects, specifically the Cheyenne helicopter.

The basis for the Pick operating system as it exists today is the structure that Dick Pick and his co-workers developed in the mid-1960s for TRW on an Army project called Generalized Information Retrieval Language and System (Girls, later General Information Management [GIM]).

The system that Girls/GIM came up (and which Pick later refined) used a paper machine optimized for information management. As much as possible, the hardware details were to be handled by the machine rather than the user, leaving the user free to concentrate on the data. The Girls/GIM project implemented this paper machine as a virtual machine on an IBM 360.

"In terms of the general concept of data management and the kinds of tools, it was complete. Now we're just trying to get in all the things we conceived of 20 years ago," Pick says.

The Cheyenne proved to be unmanageable, but it launched Pick on the path he has followed ever since. "I've spent the last 20 years trying to disprove the old saying that if you build a better mousetrap, the world will beat a path to your door," he says of his and his company's career.

After the Army project ended, Pick acquired the rights to the system and set out to develop it to meet his conception. In 1973, it appeared on Microdata minicomputers as the Reality system. Pick eventually left to market the system elsewhere. A lawsuit over the rights to the operating system was finally settled out of court in 1981. That suit was one of the reasons Pick has remained relatively unknown.

Another thing that helped keep Pick a secret was the penchant of Pick licensees to market the system under different names. In addition to Reality, Pick is known as Ultimate on Honeywell Level 6 machines and Adds Mentor on Adds/NCR minis. While the lawsuit was active, Pick Systems encouraged this kind of proprietary nomenclature.

Pick's licensing agreements were also stringent and expensive. The one-time license fee to implement Pick was $1.1 million — a provision that has since been considerably modified. Because of the system's complexity, ports were, and still are, done in-house at Pick Systems. This situation ensured that everyone's version of Pick was software-compatible, but it limited the number of systems that could be supported.

Although Pick applications are highly portable, the operating system itself is not, at least not compared with Unix or other operating systems written in high-level languages. To make Pick operate efficiently, parts of the code must be optimized for each new processor, and that takes time. Even though a new implementation involves rewriting only about 5% of the code in the system, the company estimates it takes about nine months to bring Pick up on a new processor. For an implementation on a new machine using a microprocessor that already supports Pick, the time is cut in half.

Until recently, Dick Pick has had the reputation of being more interested in refining the system than in selling it. "Up until now, selling has been a reaction — we'd answer the telephone," says Barbara Young of Pick's marketing efforts. "Now we're actually calling people."

"It wasn't until the later part of 1981 that we really started to expand," says Wahlenmeier, "so we're really only in our second year of formal growth."

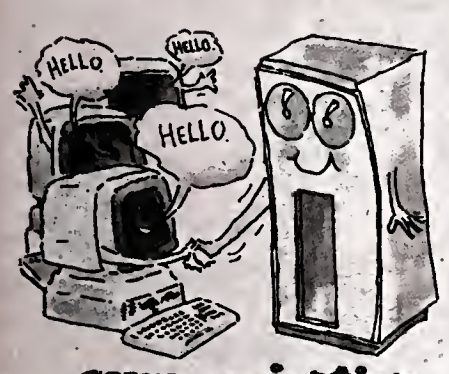
In 1982, the company became more aggressive. Pick Systems started long-range market planning and began to promote itself in the DP and business communities.

Between 1972 and 1981, according to Wahlenmeier, the company only did five implementations of Pick. In 1982, "once the company was released from the stigma of the lawsuit," it did five more implementations and added eight in 1983.

Most of these implementations have been on high-end multiuser microcomputer systems, where Pick's ease of use and software portability are major assets. Among the micro

(Continued on ID/8)

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'We've always been oriented to on-line processing'

By Dick Pick

Pick was conceived 20 years ago with the recognition that for the simple data management tool required, a new logic was also required. We proceeded to define and then implement a rather sophisticated relational data base model. Our entire system was built upon this model and still is today.

Each datum you store in Pick is actually an "item," or, if you insist, a "record," and like items or records, they are stored together as a set in a file. For example, employee records, accounting transactions — and programs created with Pick/Basic — are all stored as items in some file. Pick/Basic is intended as an easy-to-use high-level programming language and has Pascal-like power.

The way most other computer systems organize and process data has not changed logically since Herman Hollerith invented the card tabulators for the 1880 census. With Hollerith's process, sorted transactions are processed against a sorted master file to produce an updated master file and then an associated report.

That's not so with us. We've always been oriented to on-line data processing. With Pick, a transaction is captured when it happens. With a single entry, it is processed immediately, and that includes updating multiple files on multiple systems. Errors are corrected then and there and that's the end of it. Twenty years ago, I believe primarily as a result of hard-

Our initial appeal was to entrepreneurs or strong-willed managers running small to medium-size businesses — people after solutions and not afraid to try something new. Marketing and selling were left to our licensees.

ware price/performance and reliability limitations, this approach was considered radical.

Surprisingly, this "single entry" concept is still considered radical today, especially among many of my professional data processing colleagues.

Our initial appeal was to entrepreneurs or strong-willed managers running small to medium-size businesses — people after solutions and not afraid to try something new. Marketing and selling was left to our licensees. And, as might be expected of a technical person, I devoted our resources to making the product better.

In spite of ourselves, we are gaining recognition and converts, even from the elitist ranks. And what is still most important to me, we have made the product better.

Pick with Open Architecture represents the most significant milestone in our history. We feel it will gain us up-scale market penetration at an increasing rate.

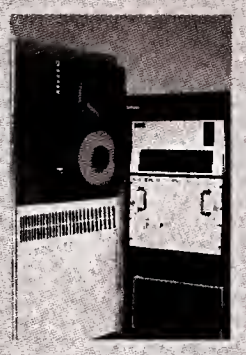
Concurrently, we've introduced multiuser, virtual memory computing to IBM Personal Computers with the Pick PC-XT software. We now cover a broad spectrum of IBM systems including Personal Computers, Series/1s and 4300 mainframes. We believe it's truly significant to span the IBM product line with a uniform operating system. Even IBM does not have a single operating system that spans its own product line.

I have spent 20 years leading the development of our system and its concepts. I like to consider these years as "tool building."



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(Continued from ID/5)

manufacturers now offering Pick are Altos, Datamedia Corp., General Automation, Inc. and Pertec Computer Corp. Pick is also available on some IBM machines. Pick Systems sees its market as business computers, from large micros to mainframes. "We don't appeal at all to hobbyists, nor do we target the scientific area," Wahlenmeier says.

Given that determination not to appeal to hobbyists, Pick's $495 price for its Personal Computer XT implementation looks a little odd. For less than $500, Pick offers a relational DBMS with an English-like query language, an extended version of compiled Basic and a virtual-memory operating system. And the Pick implementation allows partitioning of disk space, so other operating systems, such as PC-DOS, can be run as well.

By contrast, the officially sanctioned version of Unix will cost $900, and the most respected relational DBMS for micros lists for about $750.

On the other hand, as a marketing ploy, Pick's price may be the neatest gimmick since the Captain Midnight secret decoder ring hooked an entire generation of kids into drinking Ovaltine.

Dick Pick says the aim is to "get an attractively priced product out into this boiling personal computer marketplace where people can really start using it."

As the company sees it, Pick's biggest problem right now is visibility. Selling a full implementation for less than $500 is going to build a lot of visibility. At that price, many data processing professionals or business people with access to a Personal Computer XT could afford to experiment.

Paying for it

All these projects — particularly the Personal Computer version of Pick — are going to put new strains on the company. This will be the first time the company has moved into the fiercely competitive world of selling software to end users. Until now, all the training and most of the user documentation were handled by the licensees.

There is also the possibility that Pick will cut a deal with a major manufacturer to market the product on that firm's micros. Dick Pick and his executives say they are talking to IBM, but that so far nothing has materialized.

After years of internally financed growth, the company is going after some form of outside funds. So far, Wahlenmeier says, nothing has been finalized. However, he said the company hopes to have something nailed down in the next 60 days.

Pick vs. Unix

Comparing Pick to Unix is a nice way to start a religious war. Both have extremely loyal followings who are quick to rush to the defense of their systems. Both products also have definite, nonoverlapping strengths and weaknesses.

Broadly, Pick may be superior for applications portability, business applications and managerial-type computing. Unix is regarded as better for operating system portability, multitasking, communications and scientific and engineering programming. Even Dick Pick admits that for scientific work, Unix has the edge.

In a business environment, Pick has the advantage of being designed for it from the ground up, whereas Unix is being brought over from the scientific, engineering and academic worlds.

In a business environment, Pick has the advantage of being designed for it from the ground up, whereas Unix is being brought over from the scientific, engineering and academic worlds. For example, Pick has file and record locking as an inherent part of the system. Only some of the other versions of Unix do.

On the other hand, many more people are familiar with Unix. Most computer science graduates in the U.S. have had at least some exposure to Unix, while almost all the Pick people are working in industry and learned it on the job. Of course, Unix has the weight of AT&T and a host of other companies behind it. Those companies have the money for advertising, promotion and training.

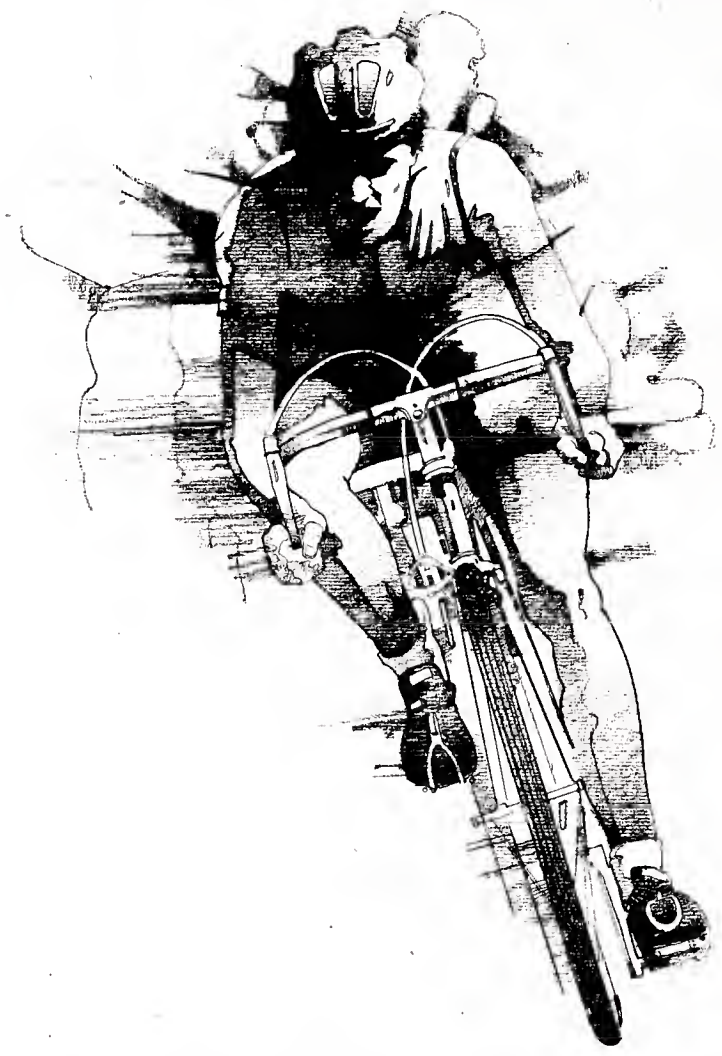
Finally, Unix has a considerable intellectual head start on Pick. It has been touted as the minicomputer and micro operating system of the future for several years.

Still, the people at Pick Systems are confident they can carve themselves a substantial place in the market. "We see Pick becoming more of a standard operating system offering from a multiplicity of vendors," Wahlenmeier says.

Dick Pick likes that idea, but his personal goals are somewhat different. "I'm going to be happy if I can keep making the system better and better," he says. "That's always been my driving force."

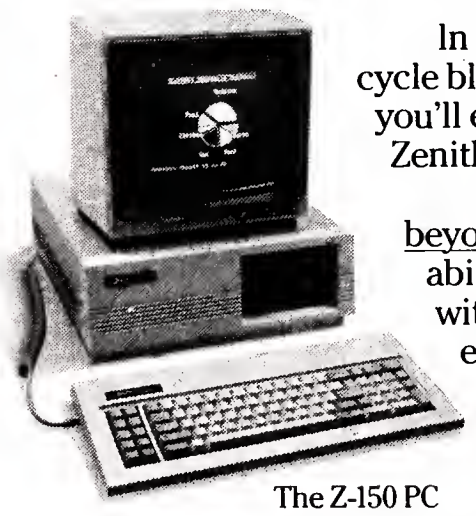
About the author

Rick Cook is a computer journalist based in Phoenix. His work has been published in Microcomputing *and* Infoworld, *and he is a columnist on the subject of compatibility in the micro world for* New In Computing *and* Computer Decisions. *Cook specializes in microcomputer operating systems and general high-technology issues.*



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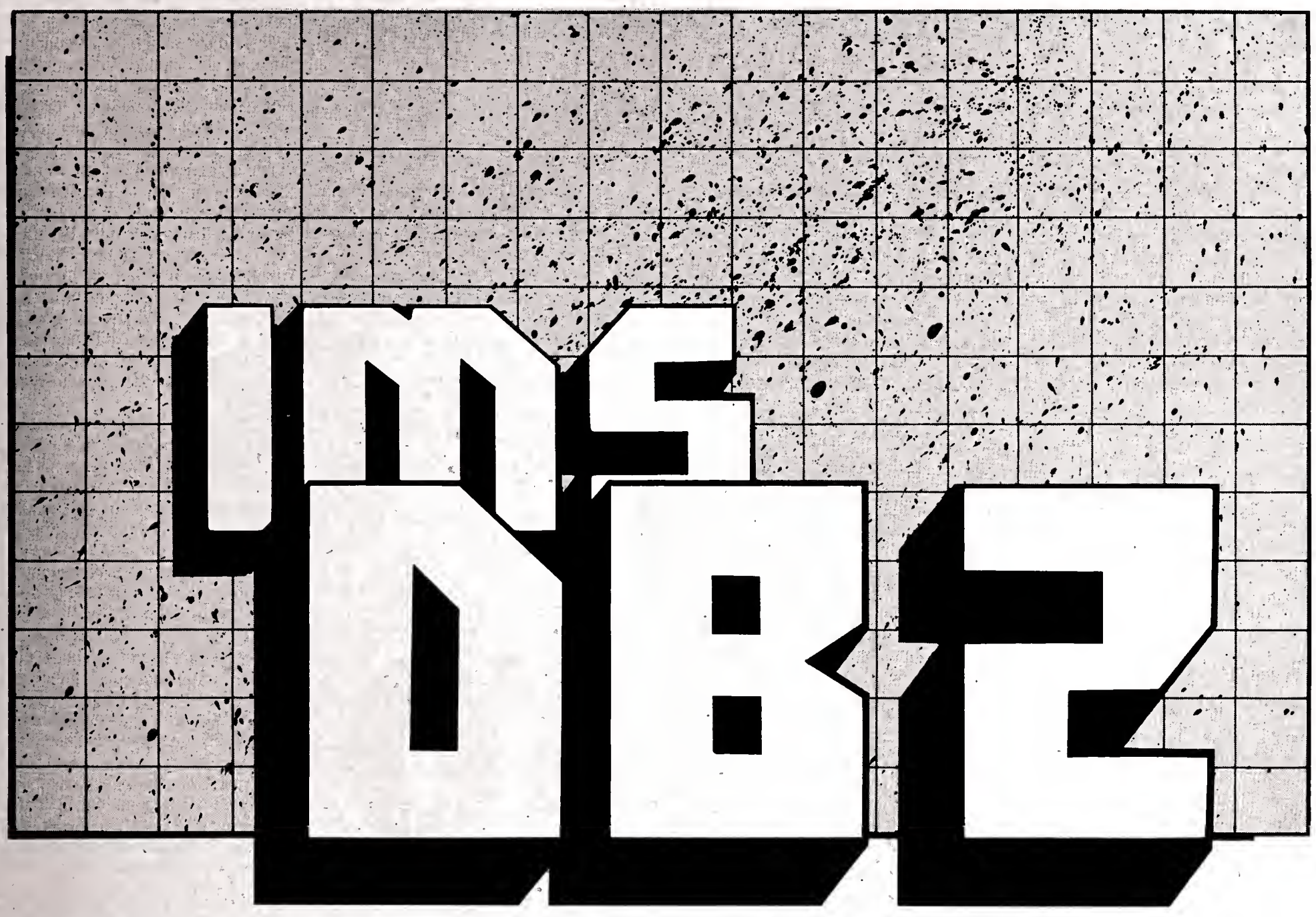
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IN DEPTH



DB2 complementing IMS

IBM's data base strategy for tomorrow

By Paul E. Hessinger

IBM's current marketing theme for its large system architecture products is "the evolution continues."

In the data base area, IMS represented IBM's only complete data base/data communications resource for more than a decade. As the DP community's understanding of data base-oriented information systems evolved, new requirements were set for effective data base management system (DBMS) implementations. Other data base software vendors moved rapidly into the fourth generation with relational capabilities and integrated software architectures. "Evolution" was neither a guideline nor a constraint for companies like Cullinet Software, Inc. and Applied Data Research, Inc. (ADR).

With IBM's new relational DBMS, the evolution of large system data base/data communications capabilities finally has moved beyond IMS. As IBM's architecture for a fourth-generation data base environment is studied, the marketing theme is evident. IMS remains the workhorse. Database 2 (DB2) emerges as a component of the evolving data base architectures from IBM.

Consider these common data base-oriented questions for a medium-size to large systems environment using or considering IBM data base and data communications products:

■ Has your installation taken IMS to the limit

With DB2, IBM's announced relational DBMS, the evolution of large system data base/data communications capabilities finally is moving beyond IMS. IBM's marketing theme becomes clear: IMS remains the workhorse; DB2 appears as a component of the evolving data base architecture.

of its capabilities?

Are development personnel being overrun with requests from end users for variations on reporting capabilities driven by IMS data base systems?

Has the information center concept provided a gateway for non-IBM software products that end users can employ but which need access to data "locked up" in hierarchical data structures?

Are you looking at the architecture of other vendors' data base software products attempting to determine if they represent an alternative to your current environment?

Is your installation considering a data base effort for the first time and are you finding it difficult to ignore all the horror stories about IMS, not to mention the lack of relational data base capabilities and fourth-generation user-friendly tools from IBM?

In the back of your mind are you thinking that just maybe IBM does have an architecture for large data base systems in place and that it is just appearing a piece at a time?

The third-generation concept suffered from too simple a view of the corporate data base, as well as from unreasonable expectations for a single piece of software — the DBMS. As a data base effort got under way, only a small percentage of corporate data resources was under the DBMS' control.

Part I. IBM's emerging fourth-generation data base architecture.

The majority of organizations that were attracted to the potential benefits of a data base approach began the implementation effort with a very simple blueprint in mind. The overall objective of the data base project would be the development of the "corporate data base" — all of the data necessary for business information processing requirements stored with minimal redundancy, to promote consistency, and maximum interrelationships, to promote sharing of data between different business operations and users.

The data base would conceptually support a variety of primarily operational information processing systems. The DBMS was the critical link between applications and data. Early DBMS implementations did not consider information retrieval and decision support capabilities to any significant degree. Most pioneers in the implementation of data base technology felt strongly that a DBMS would provide extensive control and sharing of data and dramatically improve the accuracy and timeliness of application development. These ideas can be referred to as the third-generation blueprint for a data base environment.

This third-generation concept suffered from too simple a view of the corporate data base, as well as from unreasonable expectations for a single piece of software — the DBMS. As a data base effort got under way, only a small percentage of overall corporate data resources was under the control of the DBMS. Other automated non-DBMS files (Vsam and sequential files) as well as nonautomated data were often ignored as potential sources of data redundancy and inconsistencies.

In addition, these other components of the corporate data base represented valuable sources of data for satisfying a variety of information processing applications. But if the data was not required for a specific application being developed under control of the DBMS, it was not considered in the data base design process. As a result, the DBMS apparently was not providing enhanced availability of data.

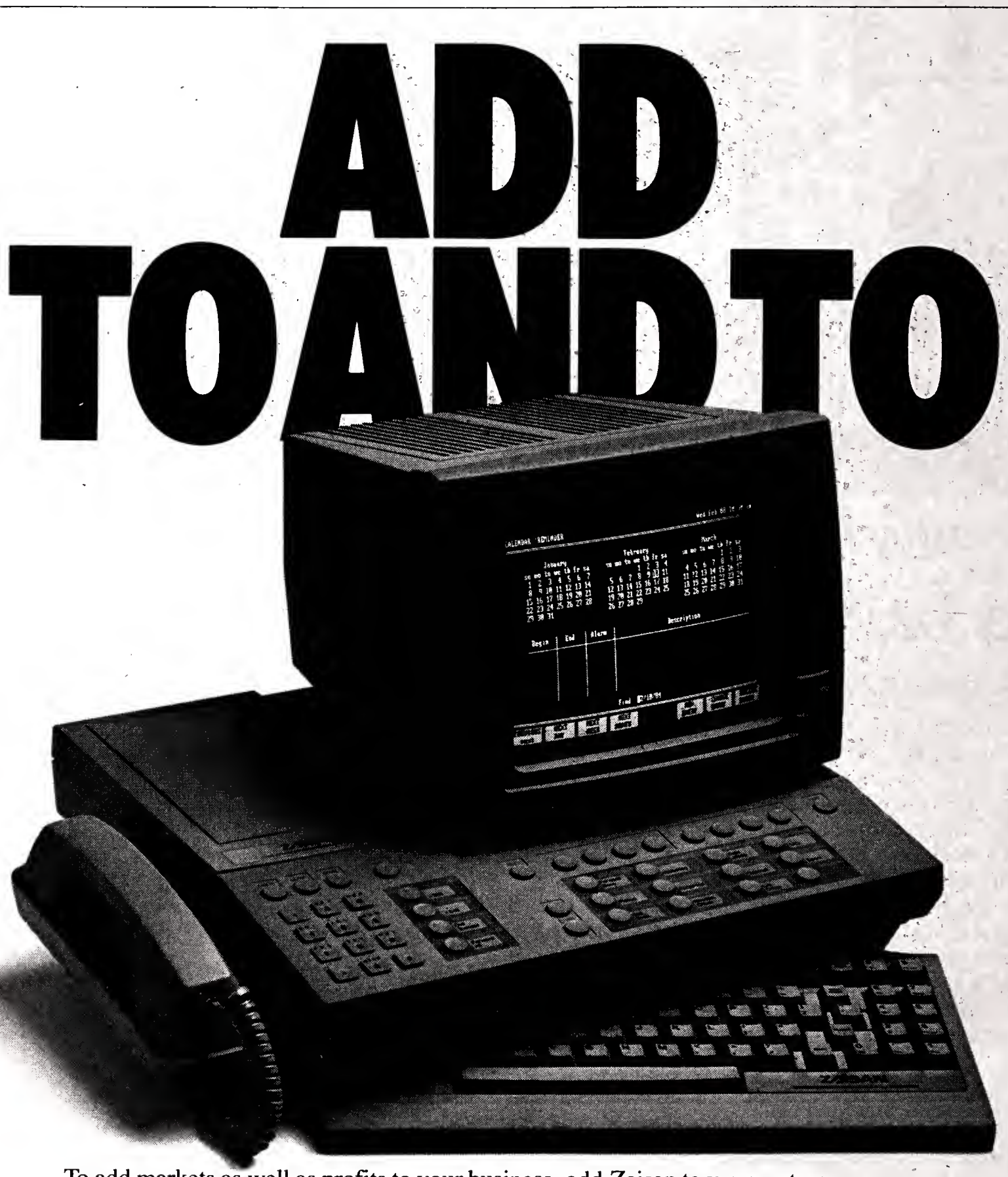
Following are the most common problems associated with third-generation DBMS:

- There was a lack of understanding about the overall format and usage of data.
- Synchronous Data Link Control (SDLC) was not modified to incorporate data base design techniques and technology (for example, data dictionary).
- Data base programming was complex. Programmers need to know a great deal about a data base in order to navigate through it to access required data.
- There was a lack of organizational responsibility for the data base effort from management and a technical perspective.

As more end users became involved in satisfying their own processing requirements, a conventional DBMS such as IMS was pressed to the limit of its capabilities.

A final evolution of the third-generation blueprint saw the emergence of new DBMS-oriented tools designed for the rapidly growing category of end-user-driven information retrieval applications. These types of applications involved rapid access to data in sequences or formats not previously anticipated by a data base design process.

The use of dictionaries and data modeling techniques helped to uncover some of these requirements, but when it came time to provide access to the data, conventional DBMS often could not support the requirement in a timely manner even if the data was physically present in



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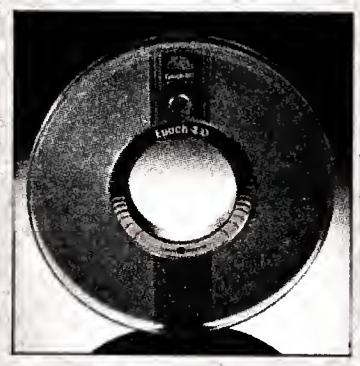
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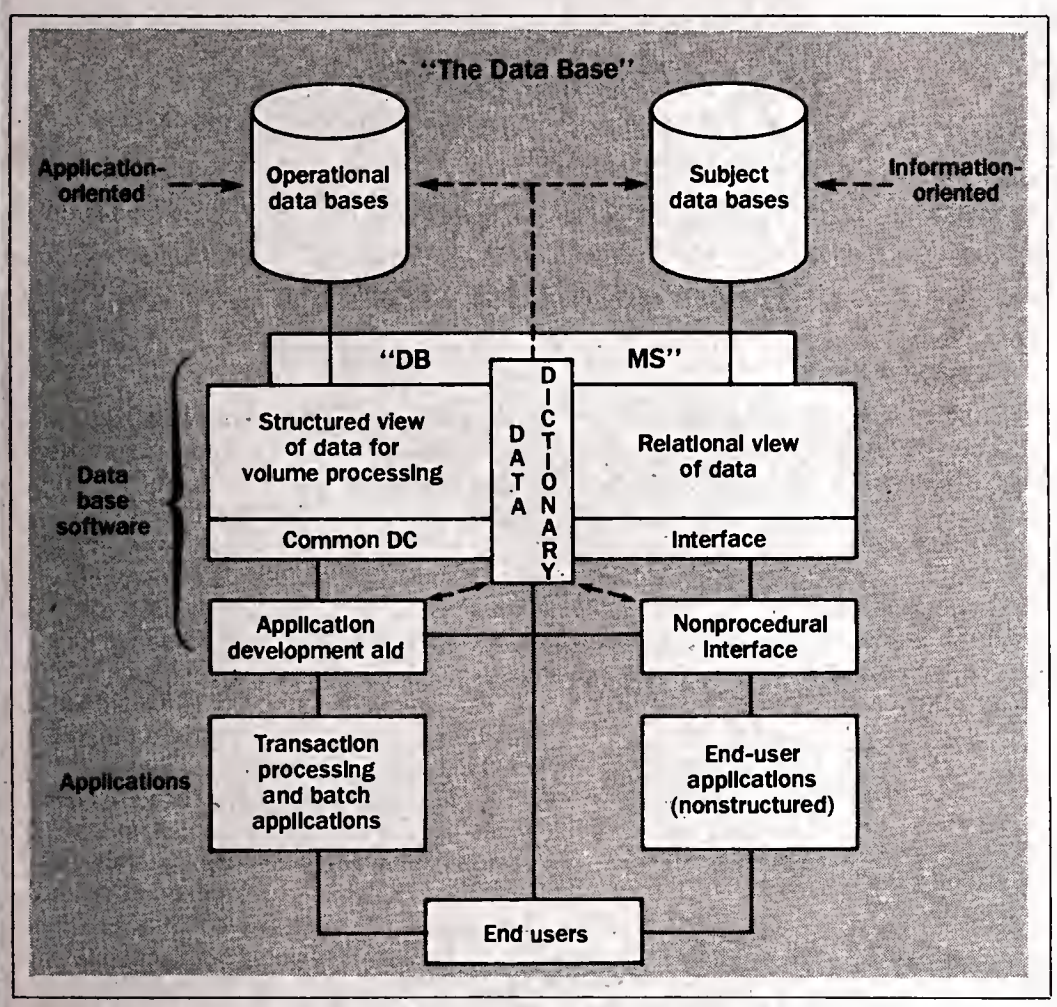


Figure 1. Fourth-generation blueprint for a data base environment

a component of the DBMS.

With this as a brief review, the fourth-generation blueprint for a data base environment begins to unfold (see Figure 1).

IBM's implementation

In the case of IMS, required data was often embedded in a maze of hierarchies, logical relationships and secondary indexes. An end user simply wanted access to data. Data base administration (DBA) personnel could utilize IMS DB's powerful capabilities to build access paths to required data, but they had to be concerned with the performance implications for operational systems accessing the same data.

What the users of IMS experienced was fairly typical of the experience many organizations had in attempting to implement the data base concept. In the case of an IMS DB/DC software configuration, emerging end-user information processing tasks seemed to highlight the "shortcomings" of IMS — and reinforce the need for relational data base capabilities.

IBM's recent direction (IMS 1.2 and 1.3) with its DB/DC products addressed primarily performance issues. Until recently, only *statements* of direction addressed the end-user data base issue.

As the third-generation blueprint was evolving, powerful non-IBM software such as Cullinet's IDMS became established as data base implementation vehicles. IBM, along with its major IMS users, began to migrate IMS into the fourth generation. Many doubted that the migration would be successful if IMS was a key component.

IBM responded to third-generation data base issues not with a replacement for IMS, as many gurus predicted, but with an array of complementary products (see Figure 2). (At one 1979 seminar, a leading IBM watcher predicted the end of IMS by 1980. A standing ovation followed. Tar and feathers almost befell me as I addressed the attendees and suggested that IMS really did work.)

The Application Development Facility (ADF, now ADF II) was introduced by IBM to address productivity of application development. The DB/DC dictionary was promoted as a DBA tool to assist in the design and control of IMS data base structures. As the pressure grew to support end-user-driven applications that utilized *information*-oriented data files — subject data base — a variety of IBM software products came into use, including ADRS-II and Query by Example (QBE). And, as a first indication of IBM's direction with fourth-generation tools, Structured Query Language/Data System (SQL/DS) appeared in 1981. (Unfortunately for MVS environments, SQL was a DOS-only product.)

Move to fourth generation

As a wider variety of data base applications appeared, new requirements were placed upon conventional DBMS. In addition to control and sharing of data and improved development productivity, a full-function DBMS had to provide for:

- Extensive data integrity and security.
- Integrated and automated recovery and restart facilities,
- Dynamic data definition capabilities.
- Utilities that can execute concurrently with application processing of data bases to facilitate continuous operation of the overall data base system.
- Opportunities to take advantage of operating system facilities and hardware architecture (for example, microcode) for physical processing of data.
- Very large data bases.

To be successful, DB2 will have to provide these facilities.

Release 1.2 of IMS in 1981 and Release 1.3 in 1983 have been dedicated almost exclusively to improved internal performance and capabilities consistent with these new requirements for large operational transaction processing data base systems. Among the features were data base recovery control, fast path enhancements, the IMS resource lock manager, multiple systems couplings, data sharing and better utilization of MVS facilities such as the Common Services Area (CSA). These enhancements to IMS strengthened

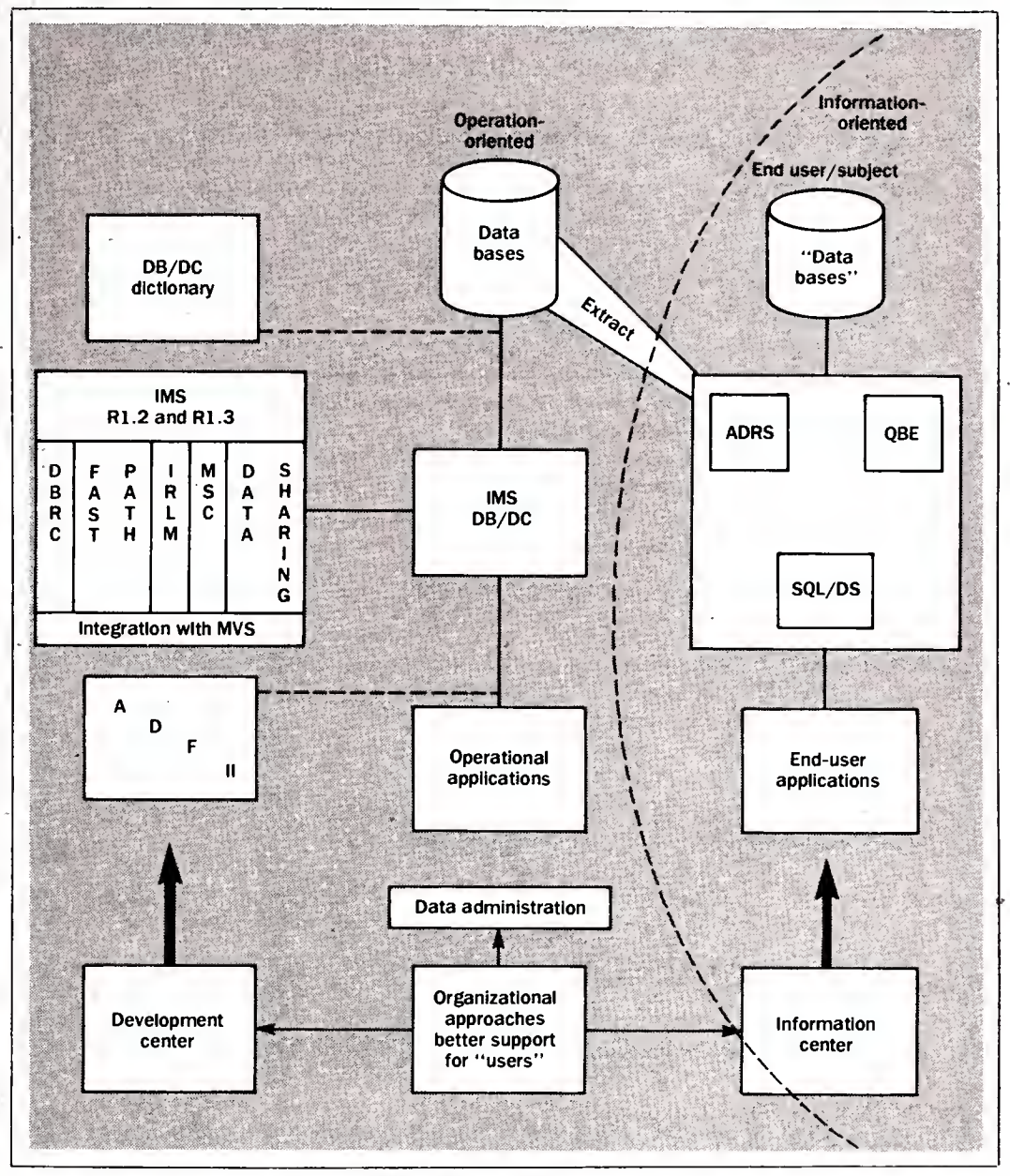
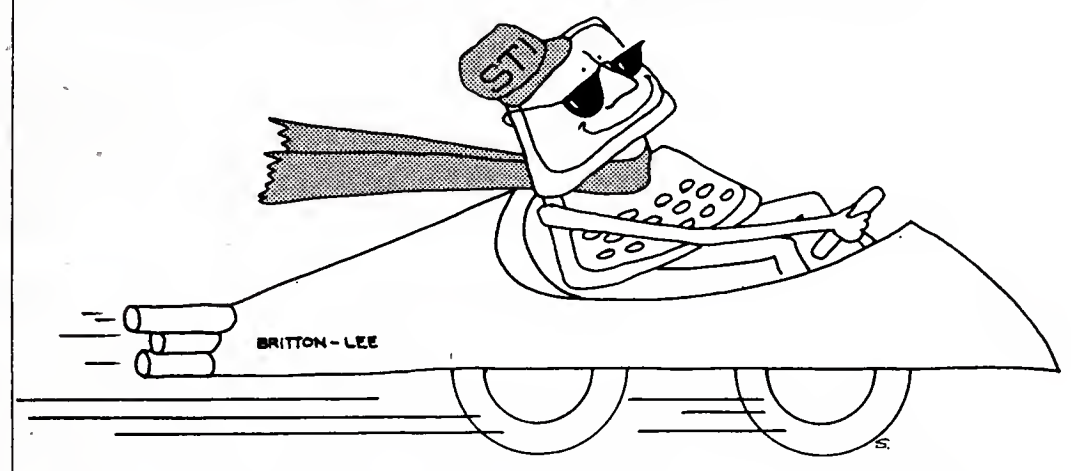


Figure 2. IBM's third-generation response

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For an effective migration to IBM's fourth-generation architecture, the operating environment of DB2 will have to take advantage of existing facilities for the integration between the old and the new. IMS will remain a key component of IBM's data base strategy.

its ability to support large systems as effectively as possible in terms of design alternative and processing efficiency.

Unfortunately, from IBM's perspective, these enhancements accentuated the lack of nonprocedural/relational data base facilities for end users' information retrieval and reporting applications which would peacefully coexist with IMS DB/DC applications. IBM seemed entrenched with IMS and appeared to fall behind other data base architectures.

In looking at the facilities of DB2 and related products, the interrelationship between existing IMS systems and new DB2 systems is a key issue.

1. How will the data in hierarchical IMS data bases provide a source of data for relational data bases?

2. How will two separate DBMS *jointly* provide the capabilities essential for a full-function fourth-generation DBMS — automated recovery/restart facilities, for example?

3. Will one type of application (production vs. end user) have access to the other DBMS' data? Will the distinction between production and end-user applications begin to fade away?

4. Finally, will the interfaces between DBA, development staffs and end user be implemented in such a way that the DBMS system will become transparent?

For an effective migration to IBM's fourth-generation architecture, the operating environment of DB2 will have to take advantage of existing facilities for the integration between the old and the new. IMS will remain a key component of IBM's data base strategy.

Part II. DB2 architecture and basic capabilities.

In examining the architecture and capabilities of DB2, there are four items to be addressed:

1. Relationship to IBM large systems architecture (MVS/XA and 3080 series).

2. Terminology and structure for DB2's relational model.

3. DBMS features of DB2.

4. Interfaces to DB2 for data definition, data manipulation and data control.

1. Relationship to XA.

From the outset, it is important to understand that DB2 was designed as a full-function DBMS for the MVS 370 and XA environment (see Figure 3). All too often, "relational data base" conjures up an image of powerful end-user query languages without the need for all "that complex DBMS stuff" (recovery/restart, load utilities and so on). With an image such as this in mind, someone interested in DB2 might not get past Page 2 of the IBM general information manual. Much of that description focuses on "large system architecture" and its relationship to DB2. The next few paragraphs will attempt a painless summary of important technical data about DB2 and its relationship to other strategic IBM products such as MVS and IMS/VS.

DB2 operates as a formal subsystem of MVS. It was designed to take advantage of the architecture of 3080 series processors and MVS/XA. It is difficult to separate one from the other. MVS/XA will exercise 31-bit addressing to take full advantage of the processing power and memory capacity of 3080 series CPUs.

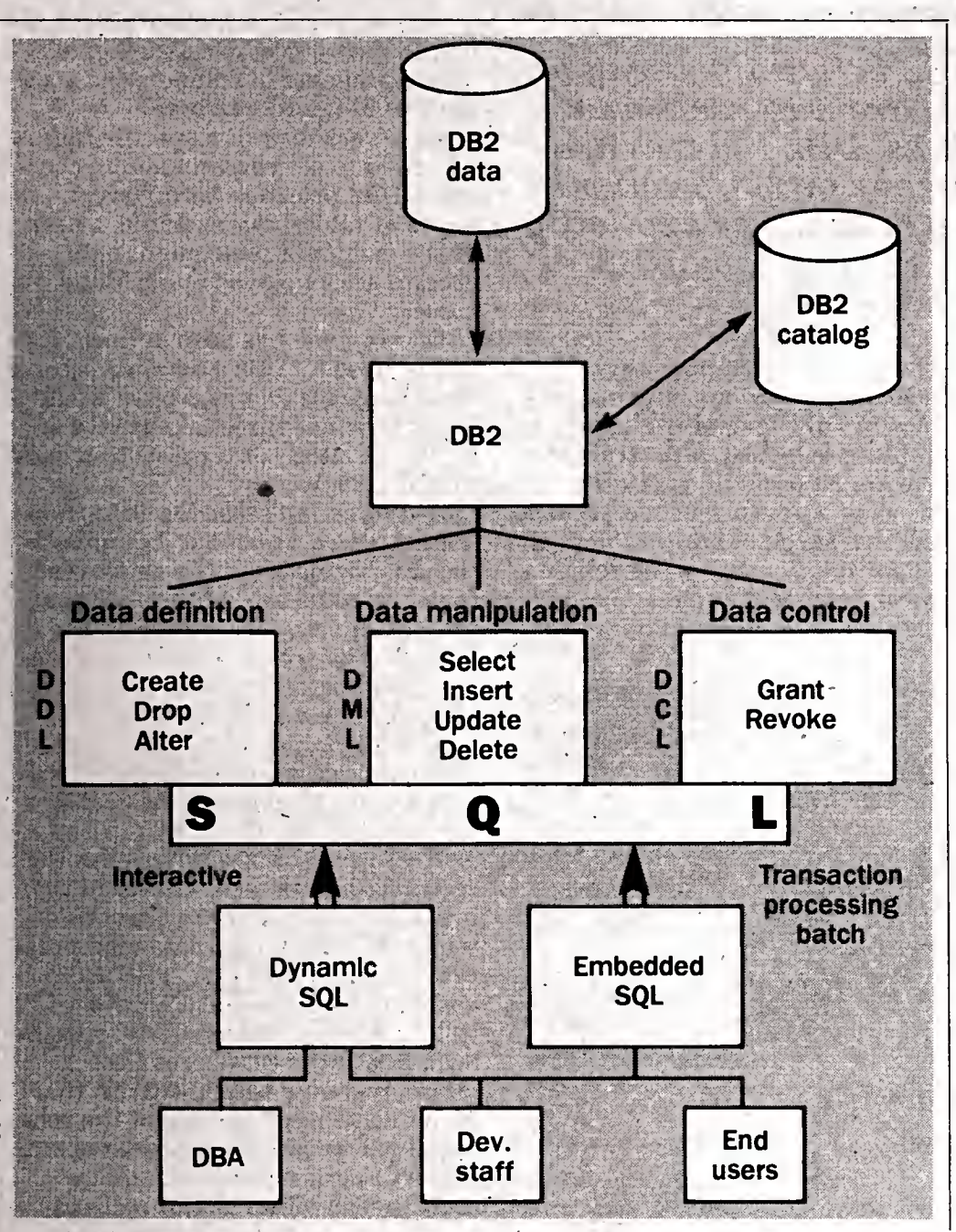


Figure 3. DB2 architecture

At the current high end of this series (3084Q), a simple image CPU complex can provide:

- Up to 2G bytes of main memory.
- Up to approximately 25 million instructions per second (Mips).
- Up to 48 I/O channels, with aggregate transfer rates of 140M byte/sec (allowing 70% channel utilization).

With the dyadic architecture of the 3081 and 3084, up to four CPUs will operate under the control of a single SCP — MVS/XA.

MVS/XA is clearly a key to the effective utilization of a 3080 series complex. However, while much has been made of the above statistics and 31-bit addressing, other features of XA provide powerful support for the data base systems architecture of DB2 and IMS. Two of these, which many IBMers consider to be the most significant aspects of XA, are cross memory services and the dynamic channel subsystem.

Cross memory services provide the ability for two or more MVS subsystems to utilize the same control block of code which has been located in CSA. An example of this in DB2 architecture is the IMS resource lock manager, which IMS also uses. The power and capacity of an MVS/XA 3080 series complex is significant in and of itself. With subtle capabilities, such as cross memory services, the throughput potential becomes even more significant.

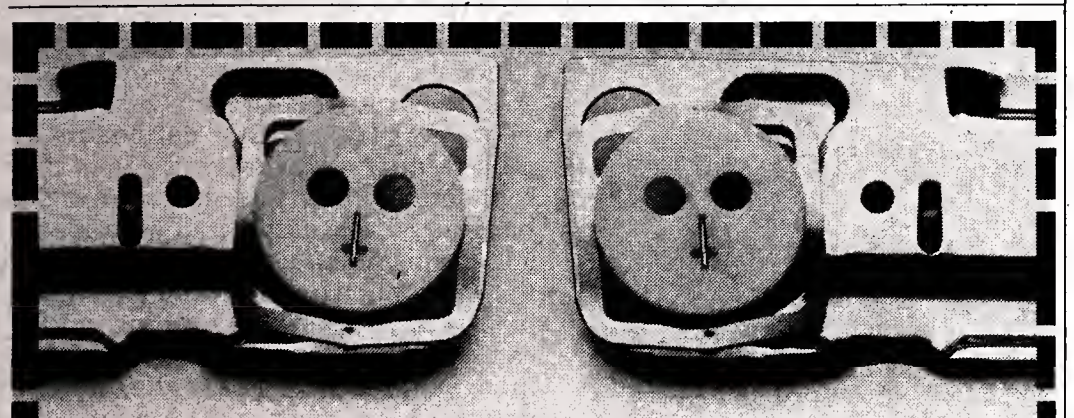
The dynamic channel subsystem of XA also offers significant throughput improvement for any subsystem with heavy I/O activity.

Clearly, large data base systems will involve potentially high volumes of data transfer between main memory and direct-access storage devices (Dasd). Aggregate channel transfer rates appear powerful enough on their own. But it is not always transfer rate that determines I/O performance. Contention for a specific access path to a Dasd volume can seriously degrade I/O efficiency.

Currently, when a subsystem issues a start channel command for I/O, MVS will select an access path to the data volume required. When the physical I/O has been completed, that *same* path must be used to return the data to MVS. But a "channel busy" condition could result if a second I/O request had been sent down the same channel.

For this reason, IBM would always recommend that storage be arranged so that channel utilization never exceeded 30% to minimize channel contention. With XA, the subsystem will dynamically select available channels for physical data transfer. The same channel that issued the request does *not* have to be used for the transfer. For this reason, channel utilizations of 70% are feasible. (Currently, the dynamic channel subsystem is limited to 3380 Dasd.)

Clearly, XA provides a solid base for DB2 in terms of CPU and I/O



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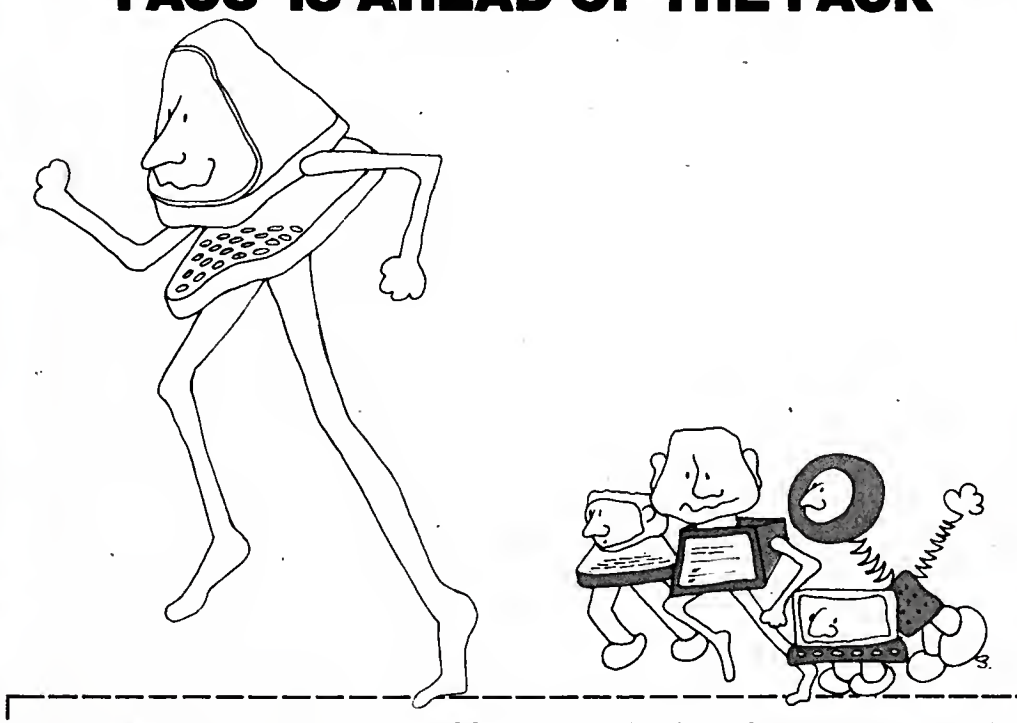
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performance. It is a definite possibility that until the supporting features of XA and the 3080 series were available, IBM did not feel that DB2 implementation was feasible.

2. DB2's relational model.

Turning now to DB2 itself, the following material will discuss the logical and physical representation of data in DB2 data bases. The following are the structural components of DB2's implementation of the relational model: tables, views, indexes, table spaces, storage groups and data bases.

A brief definition of each of these will be provided. In general, a relational data base is one that users perceive as a collection of tables, a table being a two-dimensional representation of *columns* of data. Each column represents a certain domain or field type. Rows of data represent a specific occurrence of each field in the various columns. Rows are similar to our concept of a record in a flat file.

The beauty and power of DB2 is that the use of an index is completely transparent to users and almost, so far, to technicians. DB2 indexes are based upon values of data in one or more columns. Programs or users accessing data never explicitly specify indexes; they are used only by DB2.

A *personnel data base,* for example, might have an employee table and a department table. Individual tables can have common domains, such as department number. This is the basis for associations between tables and for various information/user views of the data in the tables.

Tables are logical data structures. There are no predefined relationships as in a network or hierarchical structure. The data in the table is the basis for relationships. The relationships are managed completely and, in most cases, transparently by DB2.

To summarize, a table in DB2 is a named data object consisting of a specific number of columns and some number of unordered rows.

Not every user of a specific table will need to see each column in that table. DB2 provides for different views of tables. For example, a user of the employee table might only need to see employee number and name.

Once a view has been defined, it can be used by DB2's data management language just as a table would be. A view has three important features as a means of representing data in DB2 data bases:

a) Protecting sensitive data from unauthorized users. For example, the salary column in the employee table would be available only to payroll personnel.

b) Further reducing the complexity of data representation. A user sees only what is required.

c) Reducing data redundancy. A user can access a piece of data without creating a separate physical storage unit for that data.

If you are at all familiar with the relational model, you will recall that it is based upon three operations, which provide for all data manipulation activities: SELECT, PROJECT and JOIN. A subsequent section of this article will examine DB2's DML-SQL. But in the context of DB2 views, it should be pointed out that views make powerful use of the relational join capability. The join operation will permit the creation of a view that involves two or more tables. A join operation uses a field which is a column in two or more different tables. Based upon the contents of a common field, a relational join can create a view that contains data selected from two tables. The views are based on user-defined requirements for the data.

Relational data base has always had a mystique associated with it. Management and users are attracted to the simplicity of the table concept, but are skeptical that anything in DP can be that simple. Technicians are intrigued by the power of the technology. To be able to perform an operation like the join just mentioned without five sorts, three merges, four copies and miscellaneous utilities may offend the die-hard progammer and threaten the job security of a few others, but for the most part it will leave most wondering how it all functions.

Random access to data in file-oriented and early data base-oriented systems has been accomplished by keys. A key represents an access path to records based upon one (or more) field. Isam, Vsam, network and hierarchical data structures all employ one or more indexes to permit random access to data.

As you proceed into a summary of DB2's use of indexes, you might begin to think, "Here comes the catch. Someone is going to have to build some pretty fancy indexes in order for tables and views, as defined, to really work." The beauty and power of DB2 is that the use of an index is *completely* transparent to users and almost, so far, to technicians.

The discussion of an index begins the transition from logical to physical representation of data. DB2 indexes are based upon the values of data in one or more columns. Programs or users accessing data never explicitly specify indexes; they are used only by DB2.



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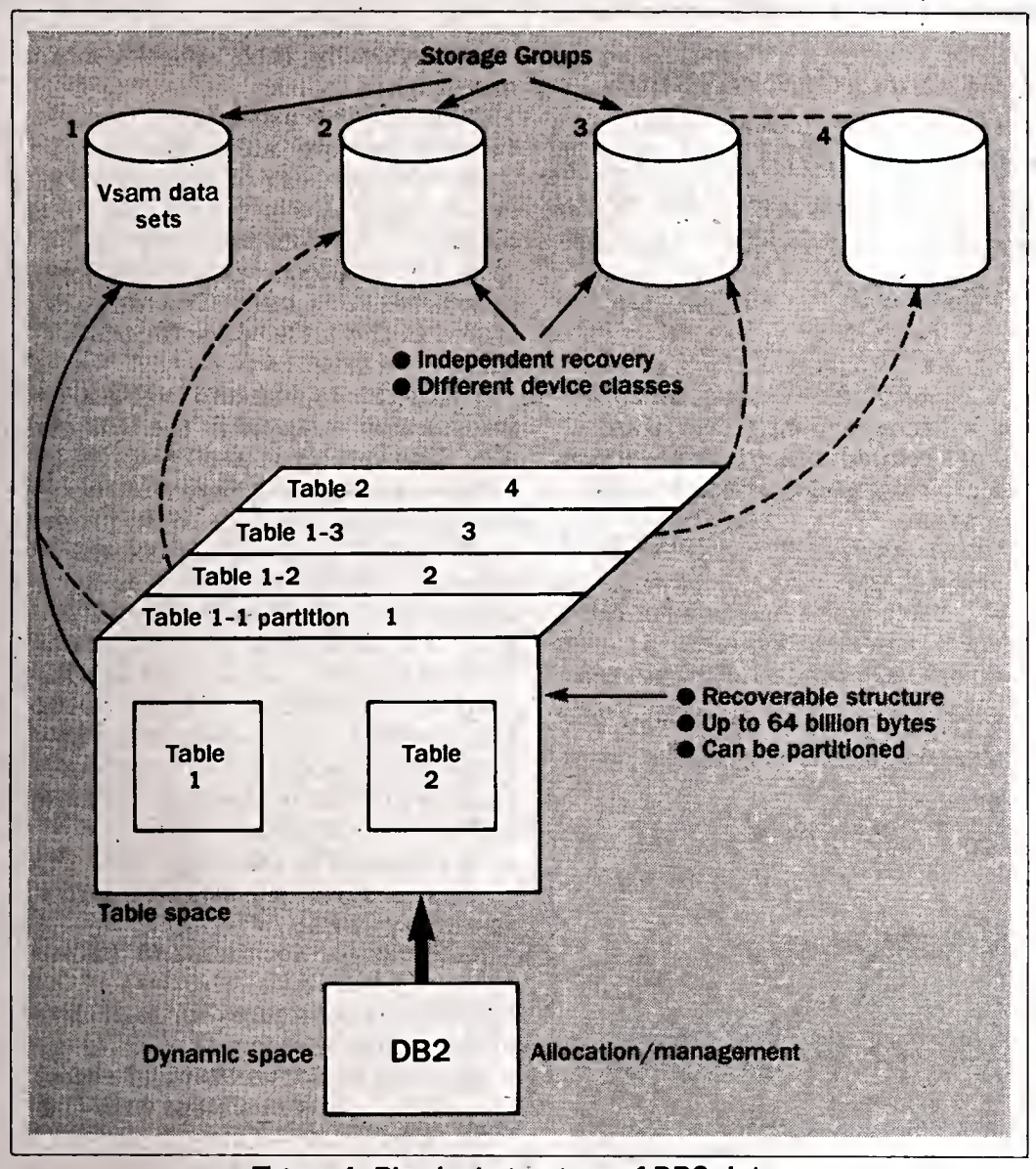


Figure 4. Physical structure of DB2 data

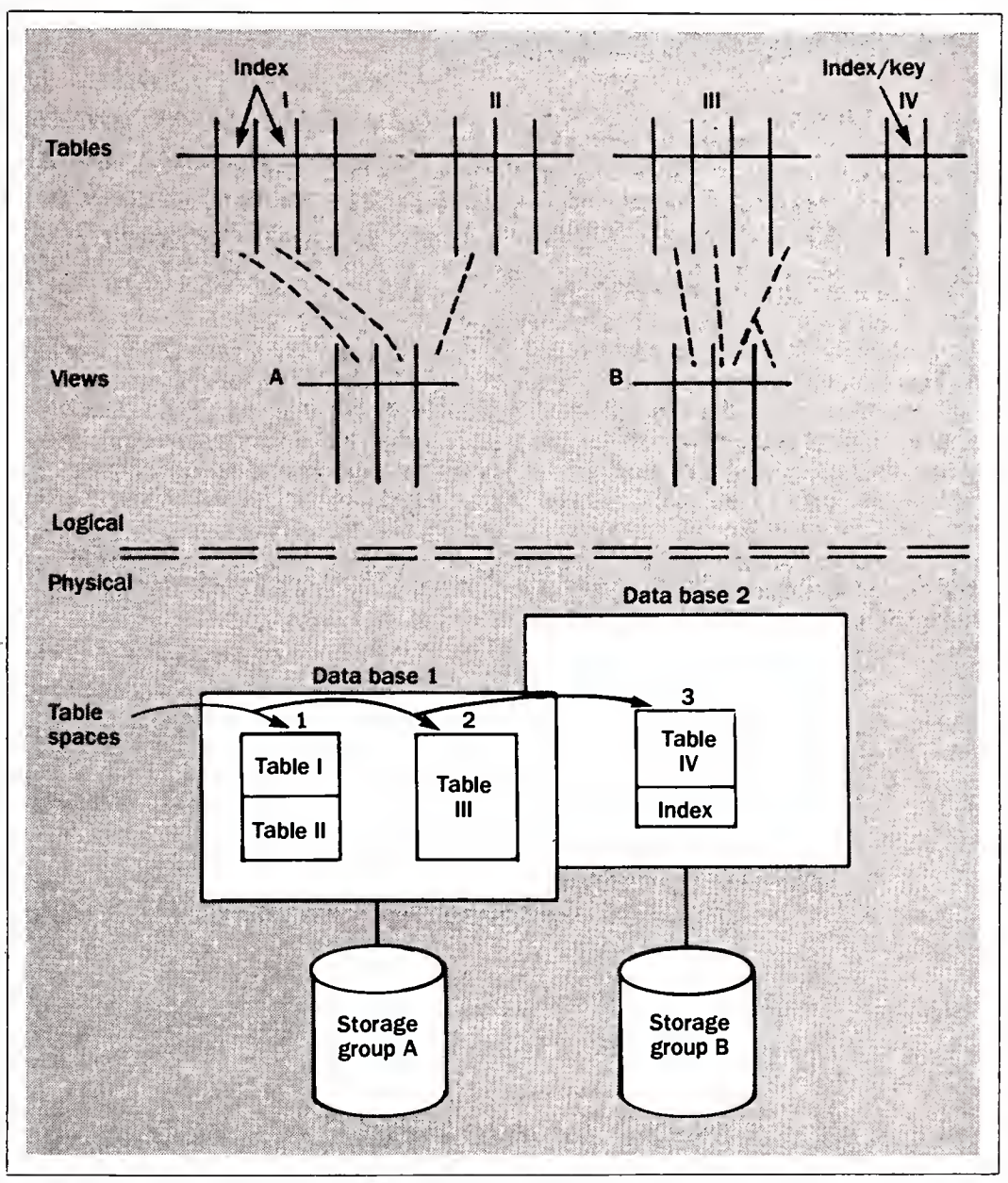


Figure 5. Physical/logical DB2 structure

When you request access to a table, DB2 looks at what indexes are available and uses the appropriate one to retrieve your data. If no index is specified, DB2 will scan a table sequentially. Indexes are primarily a performance tool. DB2 can function without them.

DB2 indexes can be unique or non-unique. A unique index forces uniqueness on the values in the table being indexed. DB2 indexes can also be used for clustering. A cluster index determines the physical order in which rows will be stored; it can be used to store data the way it would be most frequently accessed. The full power of DB2 becomes clear as the dynamic nature of an index is employed to improve accessibility.

In relational data base management and data base in general, "binding" refers to the establishment of the physical access path to data. As DB2 processing is taking place, it is entirely possible that an index to a table might be deleted, say by a DBA for performance reasons. Suppose that an application issued a SQL SELECT command that was bound to that index. DB2 will detect that the index has been dropped and will automatically invoke the bind process to select an alternate access path.

When you request access to a table, DB2 looks at what indexes are available and uses the appropriate one to retrieve your data. If no index is specified, DB2 will scan a table sequentially. Indexes are primarily a performance tool. DB2 can function without them.

To conclude a look at the terminology for and structure of DB2's relational model, we will define the objects for physical representation of data.

A table space is an address space divided into one or more pages of equal size supported by one or more Vsam data sets. One or more tables are stored in a table space.

An important architectural point: In DB2, a table space is the *recoverable structure.* DB2 can support very large tables as a table space can be up to 64 billion bytes of data. However, recovery of such a large space could degrade performance. Structurally, DB2 overcomes this problem by providing partitioned table spaces.

Partitions are established on the basis of ranges of data values. For example, an employee table could be partitioned based upon ranges of employee numbers.

Partitions within a table space can be recovered and reorganized independently. Partitioning also allows data to be stored on different device types — for example, active data on faster devices. This is accomplished by assigning partitions to different storage groups — the next physical component of DB2's relational model.

As the physical structure of DB2 data is presented (see Figure 4), it must be emphasized that DB2 dynamically manages the physical components, such as table spaces and storage groups.

DB2 users and DP support personnel need not be concerned with defining MVS data sets. One or more storage groups are defined at DB2 installation time and are assigned to Dasd volumes. DB2 then invokes access method services functions of the data facility portion of MVS to define, extend and delete physical data

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sets within the storage groups.

DB2 automatically allocates space within a storage group as it is required by table spaces as tables are processed by DB2 users. To control access further, a table can be assigned to a specific Vsam data set. If no assignment is made, DB2 handles it dynamically.

The final component of DB2's physical structure is a data base. Unfortunately, IBM's use of the term may cause some confusion. "Data base" is often used as a unidimensional entity. A corporation is building *the* data base: a single storage area for *all* corporate data. This is a very good concept, but as the first portion of this article pointed out, the concept has evolved to the point where the data base is viewed as multidimensional. DB2's use of the term reflects this view. (For example, the relationship of DB2 data bases and IMS data bases requires a multidimensional view of a corporate data base managed by IBM DBMS software.)

"Data base" is often used as a unidimensional entity. A corporation is building the *data base: a single storage area for* all *corporate data. However, the concept has evolved to the point where the data base is viewed as multidimensional. DB2's use of the term reflects this view.*

A DB2 data base is a named collection of table spaces and, by logical extension, tables, views and indexes. The data base is an operational tool. Data bases may be started and stopped independently. The DPA will put related tables in table spaces that are members of the same DB2 data base.

To summarize DB2's relational model (see Figure 5):

- A table is the basic object for logically representing data.
- A view provides alternate representations of one or more tables.
- Physically, table spaces contain one or more tables.
- Data bases are defined to contain one or more table spaces.
- Table spaces are assigned to storage groups which are collections of Dasd Vsam data set volumes.
- An index can be defined to optimize access to a table. The index is stored in the table space for that table.

All of this logical and physical information is stored in the DB2 catalog. The catalog is itself a series of tables which DB2 uses to control processing of DB2 data. With proper authorization, a user, for example a data base designer, can access the catalog as if it were a table. In this way, the catalog is a powerful data-dictionary-type facility for the DB2 system. For example, data in the catalog could be used to determine information stored pertaining to employees in the various tables within a personnel data base.

3. Features of DB2.

To summarize the other important features of DB2:

- Dynamic allocation and management of Dasd.
- Simple structures for logical presentation of data.
- Dynamic navigation and access path selection. (Consistent with the concept of fourth-generation and nonprocedural languages, users specify what they want, not how to get it).
- Self-contained automated logging and recovery (automated to IMS interfaces for these facilities).
- On-line utilities for continuous operation.
- Integrated data definition language (DDL), data management language (DML) and data control language (DCL).

4. Interfaces to DB2.

An overview of the architecture and capabilities of DB2 would be incomplete without a brief discussion of SQL — DB2's DML *and* DDL *and* DCL.

SQL is the external interface to DB2 for data definition, data manipulation and data control. As such, the acronym, SQL, is a little misleading. It is much more than a query language. SQL presents a straightforward command language. It is also a compact set of basic commands:

CREATE, DROP and ALTER for the DDL.

SELECT, INSERT, UPDATE, DELETE for the DML.

GRANT, REVOKE for the DCL.

For the tabular data structures DB2 manages in its relational model, the DDL is used initially to create the columns that define the data content of the table. As noted earlier, allocation of Dasd space and other physical tasks are automatically handled by DB2. A DBA would use DB2 utilities to load a table. Other objects (indexes, views and so on) are also created, as needed, by the DDL commands of SQL. Once created, the table is ready for access.

Through the DML, SQL in a single statement can access:

- One or more columns from a row.
- One or more columns from multiple rows of a single table.
- One or more columns from multiple rows of multiple tables.
- One or more columns calculated from other columns.

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DB2 catalog, the DCL commands are used to grant and revoke authorized access.

SQL commands can be interactively processed through a variety of interfaces, which will be discussed in an overview of DB2's operating environment. Dynamic SQL commands are almost identical in syntax to SQL commands embedded in standard application programs. Embedded SQL permits transaction processing and batch application programs written in Cobol, PL/I, Fortran and Assembler to access DB2 data *and* non-DB2 data (for example, IMS DB or Vsam).

The basic intent of this article is to provide you with an overall feeling for DB2's architecture and capabilities. It would be very easy and interesting to delve into the details of any one of the components of DB2, particularly SQL. Unfortunately, that is beyond the scope of this perspective. A brief look at two commonly used SQL commands — CREATE and SELECT — must suffice for now. The following example assumes that a user has logged on to TSO/ISPF under the user ID, PRH. (A subsequent section will discuss the specific facilities for DB2/SQL interfaces in an MVS operating environment [TSO/ISPF and so on].)

The user wants to create a table with three columns: date, client and city. The CREATE command would look like this:

```
CREATE TABLE SCHEDULE
Date        Char (6):
Client      Char (20)
City        Char (3);
```

(SQL commands and keywords are underlined.) The result is stored in the DB2 catalog as PRH.SCHEDULE.

Once data has been loaded into the table, the user could retrieve data using the SELECT command.

The SELECT command has a simple syntax.

```
SELECT      column-names
  FROM        table name
   WHERE        data meets specified
                  conditions
```

For the schedule table, an example:

```
SELECT      *
  FROM        Schedule
   WHERE        Date > 830905 and
                     < 840101
```

Basically, the user is asking for all columns of data in the table to be returned (the *) for the rows that meet the data criteria specified in the WHERE clause. Specific columns could be retrieved by naming each one required in the SELECT clause. There are many additional features of each command, but they all use the same basic syntax.

Summary: DB2 capabilities

In summary, SQL is a high-level, nonnavigational language for data definition, manipulation and control. It is the interface to DB2.

People often ask, "Isn't DB2 just an MVS version of the DOS/VSE and VM/SP product — SQL/DS?"

The preceding sections of this article have discussed the architecture and capabilities of DB2. This discussion established DB2 as a full-function DBMS. SQL is a key component of DB2 — and it is just that, a component.

The SQL/DS (data system) product announced in 1981 and first released in 1982 for DOS/VSE and subsequently VM environments was IBM's first "official" move into relational facilities. "Official" must be qualified, because as early as 1978 a relational product, QBE, was available as an installed user program (IUP). It was developed by IBM personnel for the VM environment. Apparently, it was never intended for widespread use. It was not even included in "Data Systems" discussions by IBM marketing personnel.

Two points are worth noting. First, the SQL component of DB2 is broadly compatible with the SQL/DS facility. Second, the SQL/DS product is *not* a complete DBMS when compared with DB2. The products announced in conjunction with DB2 will also support the DDS/VSE and VM environments.

DB2 is really an umbrella for IBM's emerging data base architecture in each of its processing environments. This is particularly important relative to VM, which is itself emerging as a strategic product that provides powerful supplements to both DOS/VSE and MVS configurations.

DB2 operating environment

As this article presents DB2's operating environment, two related products will be discussed: the Query Management Facility (QMF) and the Data Extract Facility (DXT), which provide interfaces between various data system products and between each operating environment and the various relational facilities of DB2 and SQL/DS.

DB2 was designed to operate in an MVS environment for relational data base management. It will employ standard data handling facilities of MVS — access method services, for example. DB2 data sets are modified Vsam data sets that cannot be accessed through IDCAMS facilities. But the same MVS code is used for I/O processing.

The operating environment for DB2 and related products can be approached from the "user's" view. In this case, user must mean DBA personnel, responsible for managing the data base environment; application development personnel, involved in the development of operational applications; and end users satisfying their own information processing requirements as well as utilizing transaction processing applications.

MVS was designed to support a variety of application types: batch for operational processing as well as technical support activity (for example, systems programming); interactive for application development and

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utility functions; on-line transactions for inquiry update processing; and end-user-oriented information retrieval and reporting systems. The various users will interact with one or more of these application types in a typical MVS configuration.

For DB2, TSO/ISPF is the primary interface for all but on-line transaction processing. Dialogue manager facilities are used to provide menu-driven panels for access to SQL and DB2 processing. A standard component of DB2, DB2I, provides interactive support for the DBA and development personnel.

The DB2I menu illustrates the facilities available to:

- Submit and test SQL statements which application developers will embed in application programs or to create tables — through the SPUFI facility (SQL Processor Using File Input).
- Develop SQL portions of application programs.
- Invoke SQL and DB2 commands and utilities.

Standard TSO/ISPF facilities such as on-line Help are available.

Either IMS DC or CICS, or both, will be used to support on-line transaction processing. The applications will process data from IMS DB data bases (IMS DC and CICS), and CICS applications can also access Vsam files.

Cobol and PL/I application programs for transaction processing can also process DB2 data. This is accomplished by embedding SQL statements in standard source code. A slightly different compilation process must be followed, because conventional compilers will not recognize SQL.

Cobol and PL/I application programs for transaction processing can also process DB2 data. This is accomplished by embedding SQL statements in standard source code. A slightly different compilation process must be followed, because conventional compilers will not recognize SQL. DB2I is used to "precompile" (see Figure 6 on ID/26) the SQL statements and create an access module stored in the DB2 catalog, which is "called" at execution time. This is facilitated through an attach facility for IMS DC and CICS code, which is provided to interface each product to DB2. You must be at IMS 1.3 and CICS 1.6 to utilize this feature.

While IMS and CICS applications can access both IMS and DB2 data, DB2 applications can only access DB2 data. The interface between DB2 and IMS DC or CICS is not limited to the application program. Other critical processing activities, such as recovery/rollback, will be coordinated by DB2 for data within its domain and for IMS DB data accessed through IMS DC or CICS.

DB2 has been designed for use in operational applications as well as end-user-oriented applications. DB2I provides the primary interface through TSO/ISPF for conventional application development, including IMS and CICS on-line programs which have SQL statements embedded.

DB2 provides the precompiler mentioned above. This precompilation creates a modified version of the application program. This version then is used in a normal compile link edit process, resulting in an object module which, at execution time, will issue a call for the data base request module, which has undergone a "binding." This process is also controlled through DB2I facilities.

The BIND creates an entry in the DB2 catalog and in an internal data set called application plans. This is a control structure used by DB2 to process SQL statements as they are executed. The plan identifies the data to be accessed, where it is and how to get to it. As mentioned earlier, if the internal structure of tables and so on changes, DB2 automatically re-creates the output of the BIND process.

While DB2I is fine for DP personnel, it does not provide an adequate interface to end users.

To provide an effective end-user interface, the Query Management Facility (QMF) was developed to support DB2.

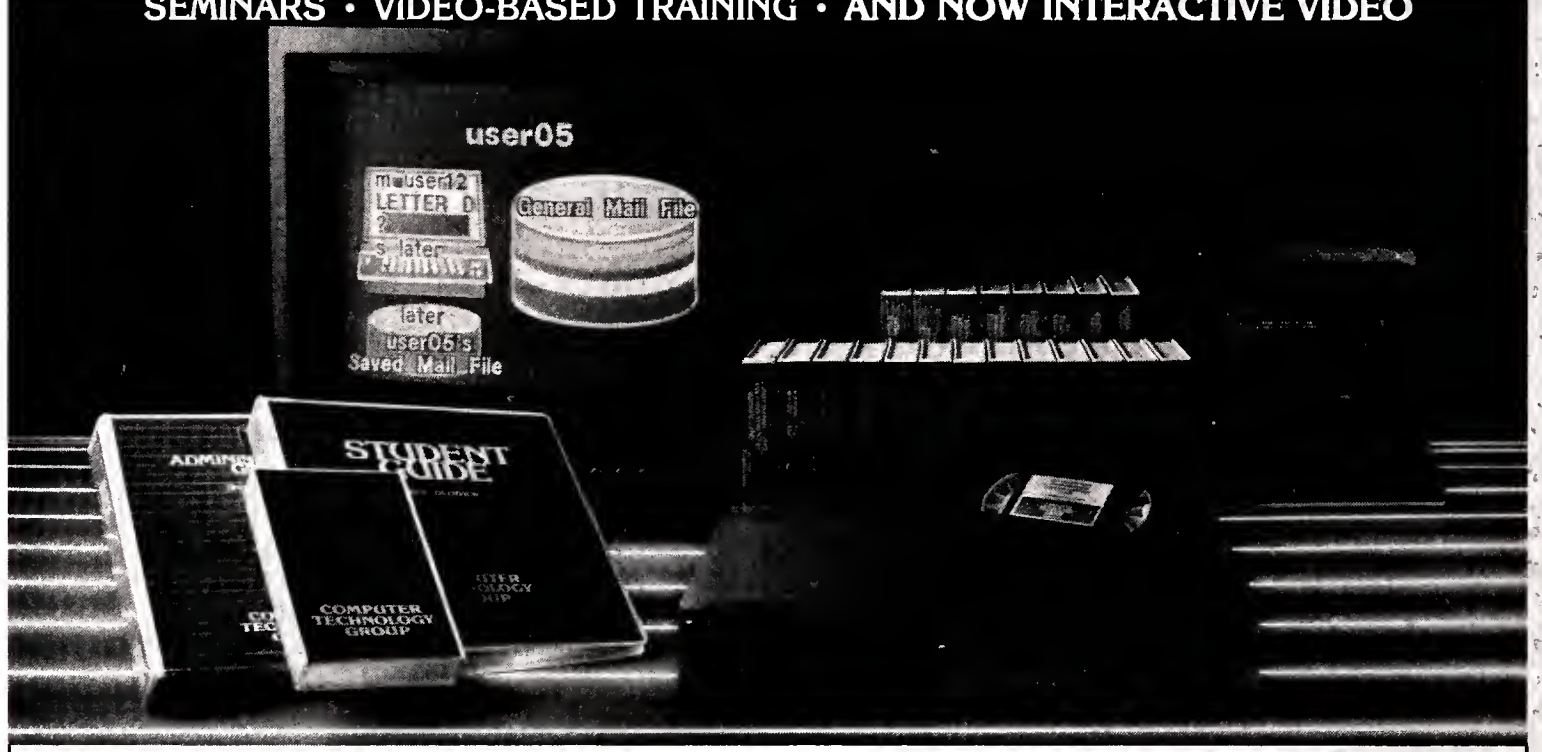
QMF was designed for ad hoc query and reporting requirements. It operates as a series of dialogue manager panels under the control of TSO.

QMF provides access to DB2 data through SQL and QBE. SQL provides an English-like command language for accessing data in tables, while QBE provides a graphic representation of tables available and provides an example of the output desired. (Many large IBM installations have "played" with QBE over the past five years. It suffered from two major problems: It lacked support from within IBM and operated in a VM environment.)

Many people in the data base world have long viewed QBE as an elegant, yet effective, data base tool. Its appearance in the DB2 architecture is an example of one of the many subtle strengths the architecture represents. In one sense, DB2 is a home for the "wayward child," which is how QBE was viewed for some time.

The format of a QMF panel used to enter a SQL command demonstrates that it is a relatively effective end-

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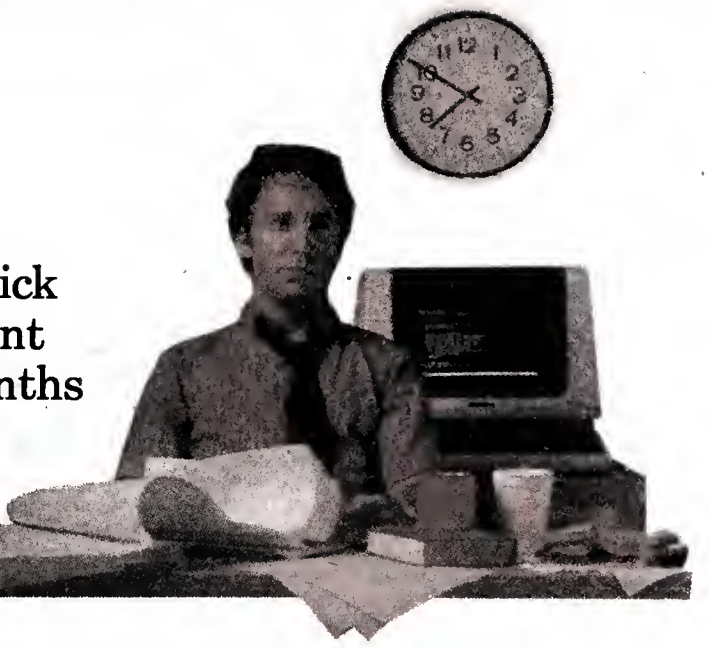
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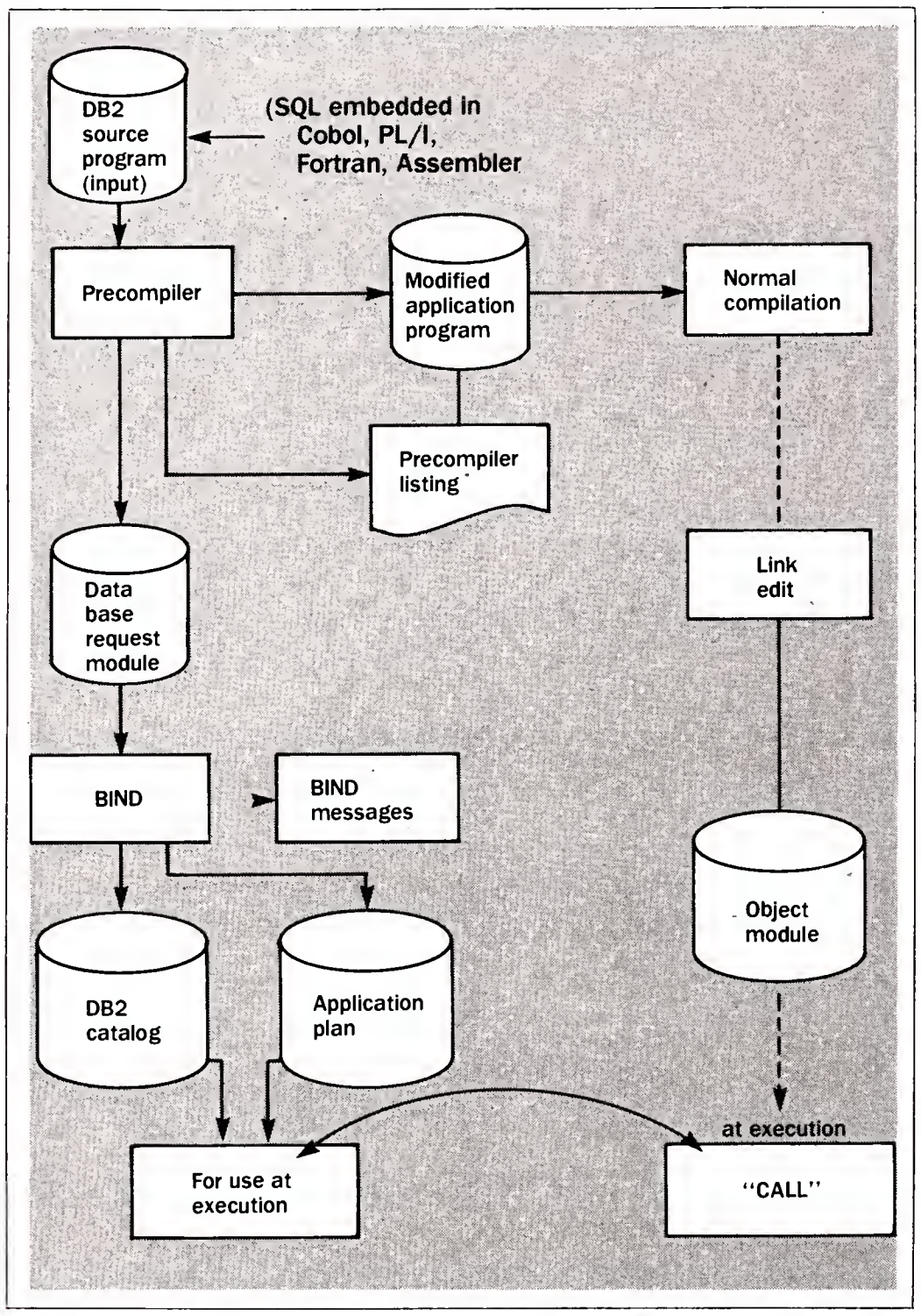


Figure 6. Conventional application development with DB2

user facility. PF keys are used to assist the user in entering the command and reviewing the resulting output.

QMF can be used to develop procedures that will be run frequently. These procedures are stored in TSO data sets and can be executed at the required time through other QMF commands. This is very similar to the CLISTS which we commonly used in TSO and VM/CMS environments. QMF was clearly designed for an information center environment; professional DP personnel would assist users in developing more complex procedures using QMF facilities.

Data system products	Environment DOS/VSE	VM	MVS
DB/DC	CICS/DL/1	—	IMS DB/DC
Relational	SQL/DS	SQL/DS QBE	DB2
Interfaces	QMF	QMF DXT	QMF DXT

Figure 7. Data systems products for IBM processing environments

One other product will complete this overview of DB2's operating environment. The Data Extract Facility (DXT) addresses the issue of accessibility to data in a mature IMS installation. IMS data bases will contain vast amounts of data at different levels of detail. This data represents the basis for high-level information requirements which DB2 will be used to address. In addition, a typical installation might have a significant number of Vsam files which also contain valuable data.

Some DB2 data bases will be developed "from scratch." But in other cases, IMS and Vsam data will be the source of data for new DB2 systems. DXT was designed to provide extraction capabilities from IMS DB data bases, Vsam files or sequential files. The extracted data is then used by the DB2 load utility to populate DB2 tables.

DXT runs as a batch application that can be initiated through TSO. When IMS data is involved, interfaces to the DB/DC dictionary assist in the preparation of PSBs required for extracting DL/1 data. By the way, this is the only area where interfaces to the DB/DC dictionary product have been defined for DB1 and its complementary facilities (QMF, DXT).

There are interactive facilities available to assist in the preparation of input specifications to DXT. For example, shipped with the QMF product will be a series of data extract dialogues which allow a user to generate and send an extract request to DXT.

In an MVS environment, then, there are a series of subsystems that will be operating to provide DB/DC processing capabilities: TSO/ISPF for interactive, DB2 for relational DBMS, IMS DB/DC and/or CICS for transaction processing and a number of other subsystems for batch tasks such as DXT.

DB2I and QMF enhance interactive access to DB2 facilities for DP and end-user personnel and operate under the control of TSO/ISPF. Attach facilities in IMS DC and CICS provide access to DB2 data from transaction processing applications.

The powerful cross memory services capability of MVS/XA facilitates efficient intersubsystem communication.

The last two components of DB2's operating environment just discussed are also used in VM configurations.

QMF would run in a CMS machine to support SQL/DS applications. SQL/DS would provide access to SQL data. Each would occupy a separate VM machine. DXT will provide data to populate SQL/DS data bases.

Data in SQL/DS could be unloaded with SQL/DS utilities and loaded into DB2 with load utilities. DXT is not required for this.

Several times recently the question has come up, "What about going in the other direction — taking data from DB2 and loading it into other formats?" This may prove to be necessary, but right now there aren't any facilities available to assist in such a transfer; DXT is strictly unidirectional.

To maintain compatibility between various operating environments, QMF is also available for DOS/VSE installations in support of the SQL/DS product (see Figure 7).

From an operating environment perspective, DB2 for MVS installations clearly fits into a fourth-generation architecture for data processing. IBM's approach had to provide carefully for integration between DB2 and other strategic products such as IMS. On the surface, at least, it appears that IBM's architecture is a significant evolution, more so than anything we have seen from IBM in the data base area since IMS was first announced. It remains to be seen whether the continuing evolution will be fast enough for large MVS installations.

Three questions remain to be addressed in this overview of DB2:

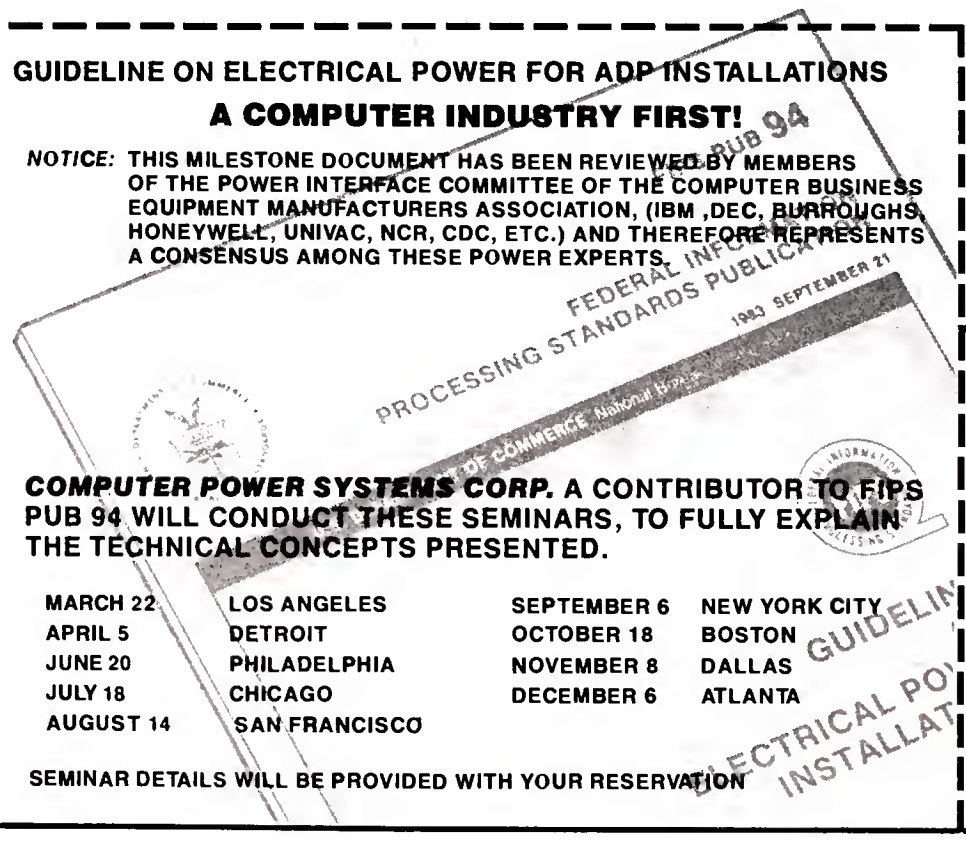
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1. Does DB2 provide us with any insights into the future direction of other IBM products?

2. Overall, what are the strengths and weaknesses of DB2 as a product and as the architecture for a data base environment which DB2 represents?

3. How does DB2 compare with other data base architectures?

In a macro view of IBM's large system configuration, MVS/XA and the 3080 series are clearly an endorsement of a high-volume, centralized architecture for corporate information systems. That DB2 has been so tightly woven into the fabric of an MVS-TSO-IMS environment is an indication that these are the products that form the foundation for an operationally oriented DP capability for a major business enterprise.

DB2 is significant because it begins a pattern that will intensify in years ahead. The facilities of MVS-TSO-IMS will become much more transparent to all but systems programming personnel. Even clearer is the fact that without the powerful 3080 series, neither DB2 and the data base architecture it represents nor the architecture of "XA" itself would be feasible.

Resource integration

A simple example summarizes the integration between hardware and software resources that will provide efficient high-volume processing using the facilities discussed above. The integration between MVS, TSO, IMS and DB2 will permit alternatives in the implementation of efficient applications.

DB2 data bases will become quite large. The architecture of the tables will permit 64-billion-byte structures. The I/O capabilities of XA and the channel rates on a 3080 series machine will support large data files adequately. Suppose that extremely quick response times are required for large data bases. The architecture of XA and the capacity and speed of a 3080 series machine permit several alternative implementation techniques:

- With up to 2G bytes of main memory, a large data base could be stored in main memory.
- To avoid degradation of overall performance, DB2 could let XA handle the paging of memory for a table in storage without the requirements for repeated physical I/Os to the DB2 data bases.

Alternatively, the large table could be partitioned within DB2 to provide efficient access to high-volume components of an overall data base.

The support for DB2 and related products in the VM environment clearly indicates that the once stabilized SCP has now become a key element in large system architecture. While components of DB2's overall architecture (DXT and QMF) are available for VM, a fully integrated DB/DC system does not exist for a VM environment. This environment is properly focused on end-user interactive computing. DB2 is a step in this direction. Therefore, it would not be surprising if DB2 were available as a VM product before too long.

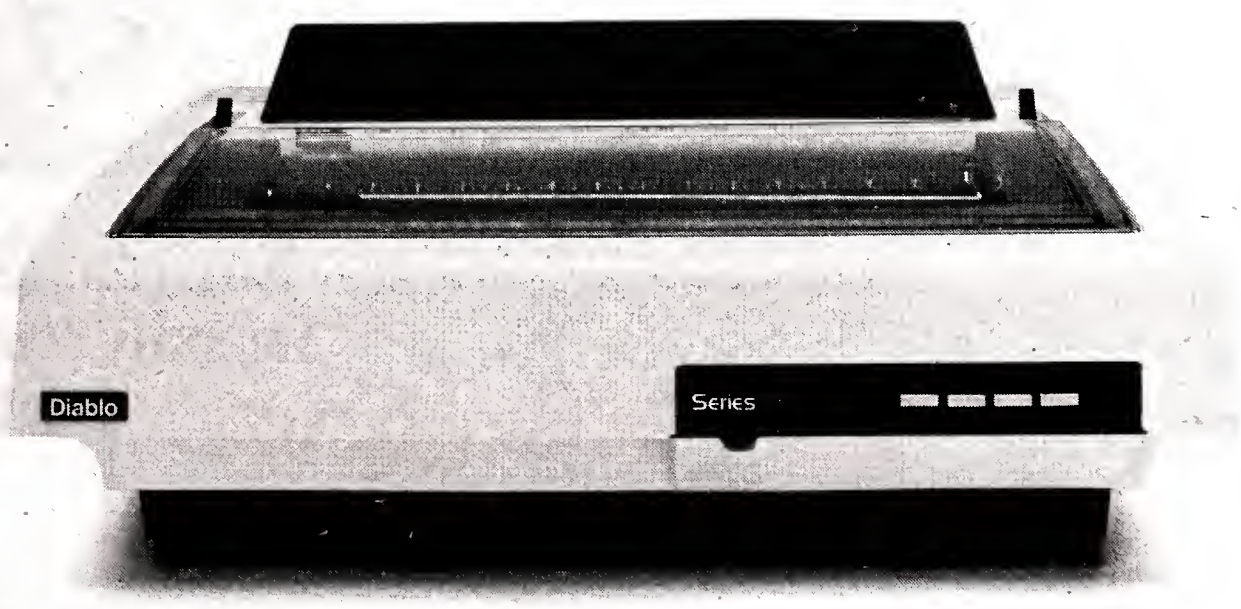
DOS/VSE appears to be an intermediate product. There are strong indications that IBM will encourage DOS installations to migrate to MVS in the next two to three years. DOS will be supported, but not significantly enhanced. Rather than a DOS version of XA, we can expect to see a subset of MVS/XA available for smaller systems. In this fashion, DB2 will become available to 4300-class installations that would otherwise be excluded from a complete relational DBMS from IBM.

What about the only other SCP still in use in larger IBM environments, VS/1? At a recent meeting with IBM personnel, an IBM product planner was asked what IBM intended to do with VS/1. His response: "We intend to stabilize it." The questioner pursued: "What does that mean?" The response: "We are going to shoot it!"

Clearly, the lack of mention of VS/1 in DB2 indicates that VS/1 has a very limited life expectancy as a supported product.

It probably goes without saying at this point, but IMS/VS is here to stay. Future enhancements will continue to strengthen its internal architecture and performance. IBM has plans for at least

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three more releases of IMS, taking us out into the 1987 timeframe.

The following are the high-level strengths and weaknesses of DB2 and the overall architecture it represents:

DB2 strengths:

■ The integration of DB2 internals with XA and large processor architecture. Result: a solid foundation for efficient processing.

■ Complete implementation of the relational model, not just a "fancy" query language.

■ Ability to supply data for structured and end-user application requirements as a result of IMS-DB2 interfaces.

■ Compatibility across operating system environments. While DB2 itself is not available for DOS/VSE or VM configurations, DB2 demonstrates IBM's attempt to provide a broadly compatible architecture for DB/DC processing in MVS, DOS and VM environments using common data system products.

■ For DP personnel (DBA and developers) the interactive facilities employ the dialogue manager of ISPF.

DB2 weaknesses:

■ Availability. DB2 itself will not be available until the third quarter of this year. QMF and DXT will be available for VM in the second quarter.

■ The lack of an integrated application development system (such as Ideal from ADR or ADS/O from Cullinet) for use by data processing personnel in the construction of transaction processing applications which will use DB2 data.

■ The lack of an interface to ADF II, although IBM's statement of direction indicates one will be forthcoming.

■ The lack of a comprehensive dictionary facility integrated with all DB/DC products.

■ Confusing signals from IBM. For example, IBM has endorsed Artificial Intelligence Corp.'s (AIC) Intellect. This AI-based English language-oriented information management system is at the leading edge of technology, perhaps ahead of its time. But little or no direction has been provided by IBM to determine when DB2 would be more appropriate than Intellect and vice versa. (Note: In the context of IBM's overall data base strategy, the endorsement must be viewed as a definite strength. But relative to DB2, it clouds the evaluation of the product.)

■ Continued reliance on the micro software "cottage" industry to develop products for the IBM Personal Computer. What about an extension of DB2 for the Personal Computer? Or will "desktop mainframes" (XT/370) provide the necessary access to DB2?

Apple Computer, Inc.'s Lisa has floundered a bit, at least partially because of a lack of mainframe data base interface facilities.

Cullinet, with the "Information Data Base" concept, extends IDMS architecture to the PC.

DB2 with its announced capabilities does not directly address the Personal Computer environment. This is a major consideration, if not a significant weakness, in IBM's architecture.

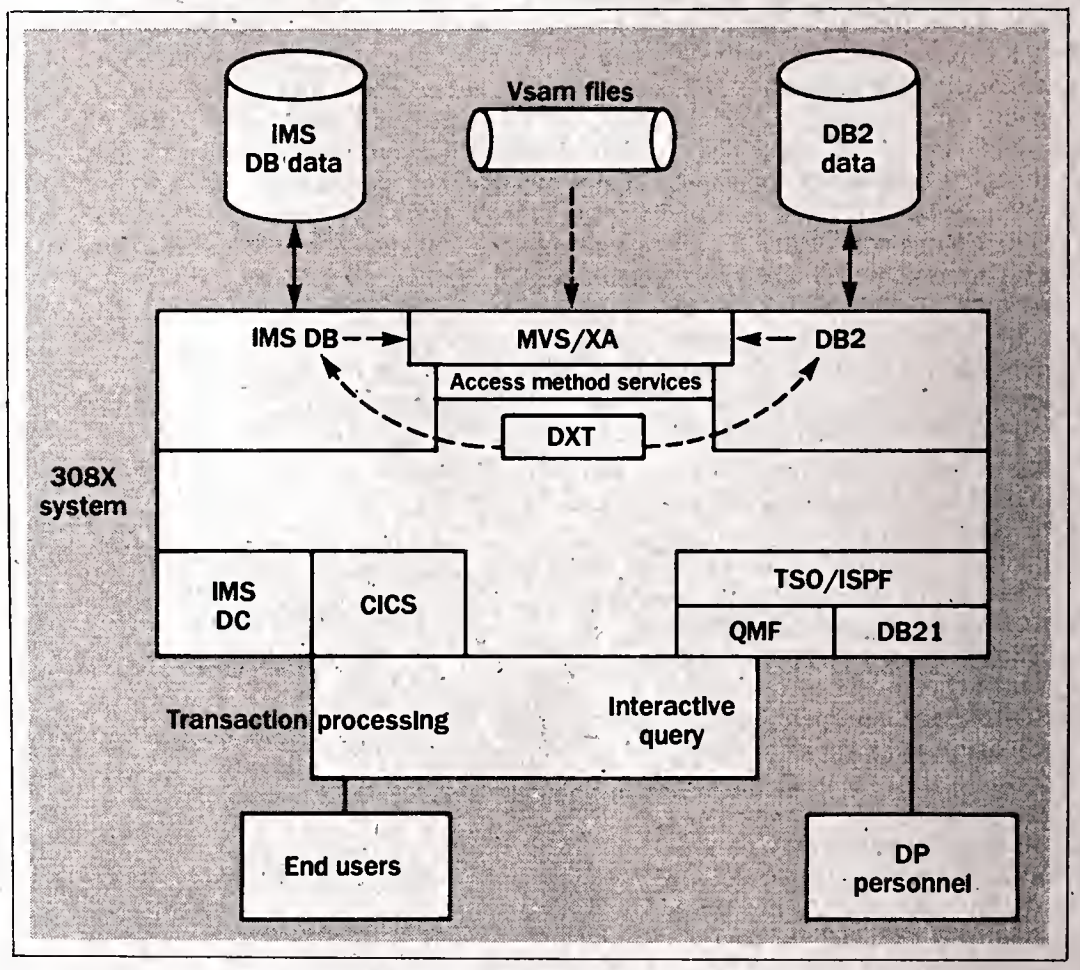


Figure 8. DB2 operating environment

DB2 vs. other architectures

Overall, it appears that the weaknesses overwhelm the strengths. However, each item will be weighted as DB2 is evaluated for a specific environment. As a specific end-user tool, DB2 will probably not fare well in competitive evaluations with Information Builders, Inc.'s Focus or AIC's Intellect, to name just two. As a complete implementation "engine," DB2 will receive stiff competition from ADR and Cullinet, among

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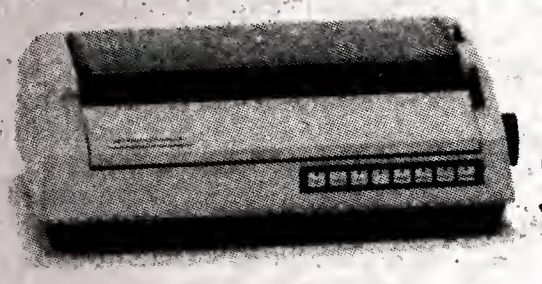
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others. As a complement to IMS data base systems, DB2 will enter any evaluation with a sizable advantage, represented by the strengths listed above.

From a purist (technical) viewpoint, such as that of a data base software engineer, DB2 does not represent a perfect architecture. From a competitive viewpoint, Cullinet, ADR, Computer Corp. of America and Software AG each possess an architecture that has superior components in relationship to DB2 and to one another.

From a management viewpoint, a simple perspective may be the most pragmatic. If an organization is committed to IMS — face it, many of the Fortune 100 are — then DB2 *is* a very acceptable alternative. If an organization has the luxury, for whatever reason, of moving beyond IMS and away from IBM products, then the architecture of the vendors mentioned above should be the primary alternatives.

In the long run, the parallel DBMS architecture IBM is promoting with IMS and DB2 is very viable. In the short term, Cullinet, with its fully integrated relational/network architecture, will dominate the data base software marketplace and rightfully so. But the potential power of IDMS/R *cannot* be used as evidence of DB2's weakness. Both are powerful in their own right.

Implementation guidelines

Following are several general guidelines that an installation can follow in considering the implementation of DB2:

- Relative to MVS, a pragmatic approach suggests you should establish an XA environment *before* installing DB2.
- If you must install DB2 in MVS/370, be sure you are not constrained in virtual memory. DB2 would accentuate that problem, perhaps bringing your system to its knees.
- If you are an existing IMS installation, begin the process of analyzing the overall architecture for "subject data bases" as they relate to the data currently handled by IMS. In other words, start planning *now* for a migration to DB2.
- If you are *not* an IMS installation, do not necessarily feel the need to consider implementing DB2 *and* IMS. If your focus will be on end-user-driven applications, DB2 could be sufficient.
- Overall, ensure that your installation is fully aware and utilizing the facilities represented by products such as ISPF, which are key in IBM's large system architecture. This will ease the transition to DB2.

Do not lose sight of the fact that any data base tool is just that: a vehicle that will help move your organization in a certain direction. With "data base" as a conceptual framework, the direction is toward integrated, efficient, accurate and timely information processing systems. Data base software technology is the vehicle. Data base-oriented methodologies for the planning, design and development of applications will chart the course the vehicle will navigate.

In an important sense, DB2's technical shortcomings, which this article has directly and indirectly presented, must not be exaggerated. This is not to defend IBM; it neither wants nor needs such defense. More important, for an organization committed to the direction stated above, DB2 represents another opportunity to deal with the issues which, if properly addressed, *will* chart the course toward a fourth-generation data base environment:

1. Defining information system requirements that are consistent with business objectives — strategic, data-oriented systems planning.
2. Managing data as a corporate resource — data administration.
3. Implementing programs designed to establish an overall data architecture for information systems.
4. Designing systems — from mainframe to micro, from end user to batch operations — that utilize the objectives of the data base concept as guidelines for effective information processing.
5. Selecting data base software tools that suit the business environment *and* information processing requirements of an enterprise.

All too often, an organization undertakes a data base implementation effort from the bottom up (starting with issue No. 5, *perhaps* No. 4, very seldom even considering 3 through 1.)

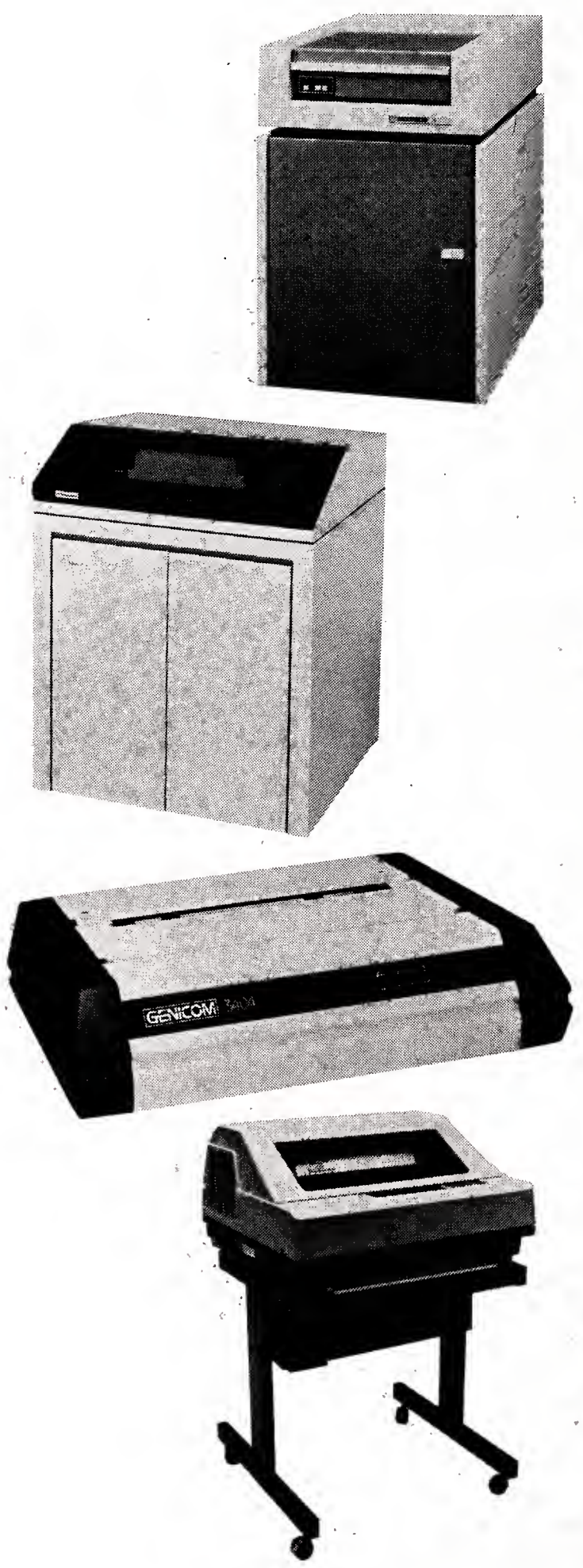
For an organization committed to mainstream IBM technology, DB2 *is* a powerful alternative for fourth-generation data base software. For *any* organization, an evaluation of DB2 is an opportunity to define a blueprint for a fourth-generation data base environment. Any particular blueprint must blend strategies, methodologies and technologies for the implementation of the data base concept. DB2, as a product, addresses only the third component. But as an overall architecture from IBM, it encourages us to deal with the other two.

About the author

Paul R. Hessinger is director of Advanced Technology Research for Computer Task Group, Inc. in Buffalo, N.Y. He is responsible for research in mainstream information systems technologies. He focuses primarily on the current product strategies and future evolution of products from major software vendors, particularly IBM.

Hessinger has been with Computer Task Group for nine years. Prior to becoming director of research, he was project manager for large-scale IMS/VS DB/DC development projects.

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IN DEPTH

Turnaround management

With turnaround management, a team of two to four highly qualified managers steps into key managerial posts within and atop the client company's data processing organization. The team's foremost objective is to turn around or reposition the DP organization so that it can move forward in aggressive support of the business.

By Joseph E. Izzo

Stuck with a problem data processing department? Let's get rid of the data processing manager!

No matter that he's working his tail off, never having learned how to say no to user requests. No matter that he's the kind of individual who seldom whimpers, even when his requisition for just one more programmer/analyst is turned down. No matter that he runs a business nearly as complex and demanding as the company it serves and that he may be tremendously overworked and underpaid.

Someone's got to take the rap for that three-year development backlog, that unforeseen 70% jump in hardware acquisition cost, the growing number of service complaints. We need a scapegoat, so let it be him.

Let me not imply that said manager is always without sin. He will, in fact, quite often lack the business skills to complement his technical know-how. To protect his domain, he may resort to high-tech jargon. He may even exude a holier-than-thou attitude. Maybe he should be let go.

In most cases though, the malfunctioning of in-house data processing organizations can be traced to more than one cause — often to a convolution of factors both trivial and significant. Terminating the silhouetted target is usually too simple a solution for a problem this complex.

Let's say that a serious problem does exist. This shouldn't surprise us because computers, despite their enormous propagation, still represent a comparatively adolescent technology and one for which economic use poses many as yet unanswered questions. How should the computer be applied? How should it be controlled? How should cost and benefit be measured to ensure a

fair return? Few corporations have recognized that ascertaining valid answers to such questions may be absolutely prerequisite to development of a responsive data processing resource. Problems, therefore, are not that uncommon.

Available solutions — whether that means fixing a capability gone catastrophically awry or simply creating an environment in which an ailing service will flourish — are comparatively few and exhibit varying degrees of success.

We've found, for example, that the role of the sit-by-your-side consultant seldom carries sufficient authority to overcome the inertia of a major problem. A more drastic approach — that of selling off the existing capability to a facility management outfit — carries with it some more obvious worries.

This kind of attitude shift is not achieved overnight. When turnaround management is called for, it demands a considerable management commitment. In fact, it can easily take as long as a year or more to overcome initial resistance.

"I had considered facilities management as a solution," one manager told us, "until I recognized that many of the very factors that fueled our information processing dilemma would very likely reconfront us when it came time to buy back the capability."

The remaining solution is what The JIA Management Group, Inc. calls "turnaround management." Under this concept, which we believe is unique, a team of two to four highly qualified managers literally steps into and assumes key managerial posts within and atop the client company's data processing organization.

These managers offer an average of 25 years of experience in business, computer technology and data processing management. And they come to the client company armed with systems and procedures, largely proprietary, that have been validated by repeated application.

The team's foremost objective is to turn around quickly or reposition the DP organization so that it can move forward in aggressive support of the business. Of course, that positioning must be accomplished in such a way that the department not only performs well during the turnaround team's residency, but also becomes sufficiently well organized, staffed, educated and motivated that a high level of service continues long after its departure.

A secondary objective is to reinforce strongly the credentials and acceptance of the data processing staff by adding to the staff's technical qualifications a familiarity with the principles of business planning and priorities as they might be viewed by the firm's executive offices — in short, giving data processing a business focus. Typically, the team leader, acting as department head and establishing an empathetic interface with the firm's user organizations, is the chief instrument of this achievement.

How well turnaround management can work was demonstrated a few years back at the Lincoln Telephone & Telegraph Co. in Lincoln, Neb. Lincoln Telephone is a utility whose data processing shop — despite the best of intentions — lacked the ability to implement the modern-day, online systems so necessary to customer service improvements. Yet after about 12 months of a turnaround management contract, the department proved its ability to design and develop major software systems, and the firm's customer service record improved dramatically.

So taken with its success, Lincoln Telephone recommended the concept to a major Midwest producer of high-fidelity equipment. The company hired JIA to turn around a data processing department that, despite some 50 people and millions of dollars worth of computer hardware, simply was not functioning.

When the turnaround was complete approximately 14 months later, JIA consultants had replaced themselves with a qualified internal management team, had instituted a major training program for the entire staff and had installed the company's first set of data processing standards and procedures covering everything from proposal format to quality assurance requirements.

One of the client firm's key executives found a changed company attitude. "When JIA arrived," he reported, "everyone in our company hated the DP department. It was not reliable, it fouled up and the like.

"By contrast, the department has now gained the confidence of our organization," he added. "Now there's dependability and good communications."

Not an overnight solution

This kind of attitude shift is not achieved overnight. When turnaround management is called for, it demands a considerable management commitment. In fact, it can easily take as long as a year or more to overcome initial resistance, to educate the staff and to install new ideas, policies and procedures, while simultaneously maintaining and upgrading day-to-day operations. The greatest results are usually reaped toward the end of the contract, long after the JIA consultants are gone.

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2. How many documents do you normally retrieve each day? ☐ Less than 10 ☐ 10-25 ☐ Over 25

The Kodak KAR-4000 information system. It gives the computer a photographic memory.

Kodak

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Turnaround management can also be effective on a more limited scale. In many instances, these same methods are applied to a single unit or function within the larger DP department: to systems development, to operations, to quality assurance or to business systems planning, for example.

One of the country's largest suppliers of private-label cheese had such a need. In this instance, the client's growth required major hardware additions coupled with state-of-the-art software and a new, more sophisticated operating environment. The operations staff, then about 30 people, couldn't meet the challenge and probably faced termination if an alternative solution could not be found.

Beginning with an effectiveness review, a JIA team of two individuals tackled the development of a data center operations improvement plan that ultimately established project request procedures, planning methodology and system turnover procedures among its several facets. The team also set up the documented methods to automate tape library management, automate software production and test, establish a viable recovery and restart procedure and implement other needed operational improvements. JIA also played a key role in procurement of a major software package.

Management involvement

True and lasting success of turnaround management almost invariably demands one very significant ingredient — the direct involvement of executive management: first to establish objectives for its data processing resource and then to monitor and control the operation to ensure continued attainment of the desired cost-benefit ratio and other goals.

Classically, top executives have more or less ignored data processing as they would never ignore engineering, marketing or finance — in many cases, simply because of uneasiness in dealing with the unfamiliar technology, compounded at times by the problems of technicians' jargon or aloofness. Yet in working with more than 100 client companies, we've learned that these executives can overcome this distance and learn to make correct decisions about data processing through the vehicle of the executive policy committee.

Properly framed, the data processing executive policy committee is not a discussion group, but a decision-making body made up of the firm's senior executives. Acting much as a corporation's board of directors does in serving and guiding the corporation, this group sets the data processing objectives and policies, appoints the top DP executives and approves their organizational structure, analyzes service responsiveness and reviews — for potential returns — major development projects and other proposed expenditures.

Believing that performance of the executive policy committee would depend largely on the quality of information on which it must act, JIA developed a number of innovative standards for reports and proposals to go before the committee. For proposed expenditures, the committee receives a document known as a decision package, which has proven to work primarily because it presents its case in business language rather than computer terminology. It also demands that the corporate user for whom the development is proposed participate fully in formulating the proposal.

Bergen Brunswig, a JIA client and a distributor of pharmaceutical and health-care products, had been heavily involved in data processing for many years, even operating a computerized inventory control system since 1955. Yet the company's president, Robert H. Martini, and other senior executives felt that until they had established the DP policy committee, they lacked the ability to manage or control the service properly.

"It seems easy to manage other parts of the business," Martini said, "but DP was always a mystical area."

As evidence of committee effectiveness, Bergen Brunswig has since reported about a 50% cut in backlog of DP projects from approximately 20 staff-years at $40,000 per year to about two staff-years . And the firm credits the committee with a drop in DP turnover from 35% to 8% in a single quarter.

Start-up situations

For the company that believes the best cure is prevention, JIA offers a start-up management service that employs many of the same principles of turnaround management. As with the turnaround service, the concepts can be applied to an entire DP department or just a new unit within the department.

In the typical situation (much like the separate case history of the Angeles Corp.), the client used outside services but reached the point where the bureau no longer seemed the most cost-effective or timely answer to data processing needs. In such a start-up, JIA can shoulder the entire burden, beginning with preparation of a detailed strategy plan for the changeover.

Subsequent functions include the actual hardware and software selection process, effecting the transfer from the service bureau, installing necessary standards and procedures, setting up an executive policy committee, designing the computer center, managing it until all the wrinkles are out and finally selecting and training the staff to replace JIA.

JIA's role in starting up a brand new unit within an existing data

(Continued on ID/36)

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How the management contract works

The management contract is one way of quickly repositioning a data processing department and developing it into a professional, high-performance organization in a short period of time. This is accomplished by placing a JIA data processing management team in the department on a temporary basis to "turn around" the performance of the organization. During its tenure, the team's major responsibilities are:

- To effect a quick turnaround in the performance of a data processing organization.
- To develop within the client company a strong, reliable, enduring professional data processing organization, which includes finding the training replacements for the temporary management team.
- To install methods and practices for ensuring an ongoing, quality organization with appropriate management reporting and control.

In bringing about the turnaround of a data processing organization, the management contract has some basic advantages over the more conventional methods of hiring a new management team or promoting managers from within.

The motivation is different. Under a management contract, the goal is to develop a lean but strong organization. Since the outside management team is there for only a relatively short period of time, the interest and focus is to put in place only what is needed; there is no tendency to build an "empire."

The contract management team has no personal ties to existing members of the organization and, therefore, can be objective in evaluating an individual's performance.

The JIA staff is experienced in working as a team to accomplish major DP objectives. In contrast, if a new manager is hired, it may take a minimum of six months before he can form and test a team that can move aggressively forward.

Many of the professional methods and practices required to effectively operate a data processing organization exist within JIA and have been tested and implemented in many organizations.

Therefore, the cost and time required to develop these methods and practices is minimized.

With a management contract, the team's success is measured by its ability to make the required changes on schedule and to select managers who will maintain a high level of performance for the organization in the future. There should be no need for outside management assistance when the management contract is completed.

A management contract is not designed to provide "hatchet men," but to serve as a means of enhancing the skills of in-house talent. Individuals will be replaced only in those cases in which capabilities are below acceptable standards.

Situation dictates size

Based on the size of the data processing installation, the number of JIA managers at the beginning of a management contract will range from 2½ to five, depending on the complexity of the situation. The contract's duration could be eight to 14 months. The time period is specified at the beginning of the engagement.

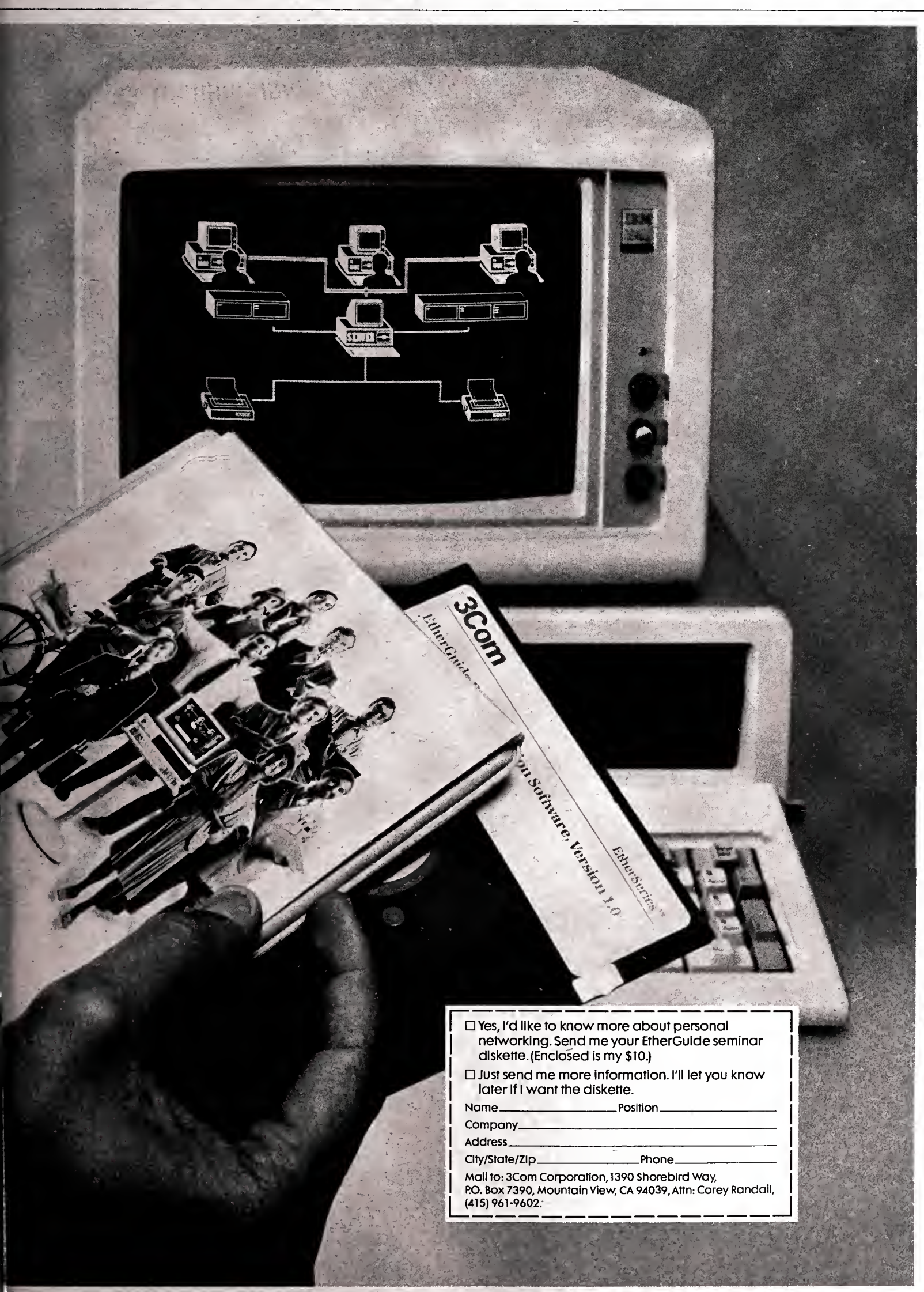
A brief scenario follows. For purposes of illustration, we will assume the requirement is for four members of the JIA management staff and the duration of the contract is 12 months.

During the first three to four months, four JIA team members would be assigned to the client site. At the conclusion of that period, one member will be replaced by a trained internal DP staff member, bringing the number down to three. At about the sixth month, an additional member of the JIA staff would be replaced by another staff member. At approximately the ninth month, the third member of the JIA staff would be replaced. The remaining JIA staff person would leave at the end of the 12th month.

This approach allows for the gradual shift from a JIA-managed organization back to a client-managed organization. The JIA management team brings about this shift and effects change while managing the daily activities of the organization.

Several other general features of the JIA management contract include:

- The JIA staffing levels are reviewed formally each quarter to determine if reduction of JIA staff can be accelerated. An increase in JIA staff should never be considered since this defeats the purpose of the contract; the goal is to develop the people internally.
- The contract can be canceled at any time, with 30 days' notice.
- JIA will assume all responsibility for managing data processing within the client's policies and guidelines and report directly to the executive in charge. Outside advice and counsel will be provided to the contract management team by JIA executive management.



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(Continued from ID/34)

processing department is normally much more limited in scope. At Bergen Brunswig, J1A helped establish two new units — business systems planning and quality assurance — in addition to formation of the firm's executive policy committee.

For the most part, J1A's clients are firms undergoing a key transition of some sort — entering an exciting growth period, experiencing a product demand that's difficult to satisfy, reconsidering basic objectives or market strategies or even retrenching for one reason or another. In most cases, the transition demands samurai performance by data processing.

When it comes to developing specific solutions to the firm's problems, J1A consultants have been successful almost entirely because they are in a position to apply a vast amount of directly related experience and can do so in an objective way.

Experience level

For example, attaining improved personnel performance requires a well-stocked armory of reliable cause-and-effect experiences. From their work with many other clients, they know the results of adding people, adjusting salaries, reorganizing the department or units within it or even terminating people. And their actions are convincingly objective because their finite "reign" allows them a dispassionate, detached view.

Moreover, their limited time in power demands that replacements be certifiable before that date. To ensure that happens, they begin to inform and educate the entire staff from the first day. Their initial objective is to alleviate the natural trepidation that occurs on arrival. A carefully orchestrated presentation, open to all DP personnel from managers to keypunch operators, explains precisely why they are there, what they propose to do and how long it should take.

Within the subsequent few weeks, the consultants conduct question-and-answer sessions with smaller groups. At one time or another, they talk privately with each individual about his goals and how they might best be achieved.

The consultants are always concerned about developing each staff member to his highest potential in line with the individual's goals. Naturally, those individual wishes sometimes conflict with the client's aims, making changes imperative. At worst, and this has applied to some department heads, it may be suggested that the employee seek another job.

Most often, however, shifting the person to a different function within the organization is the better solution and often benefits the employee directly. For example, switching a middle manager from programming to quality assurance exposes that individual to a new overview of the system development cycle and the tools and techniques by which the cycle is best managed. That person then ends up with a depth of business experience to complement his technical qualifications.

Most often, shifting the person to a different function within the organization is the better solution and often benefits the employee directly.

To illustrate more specifically the firm's approaches to real problems, several brief case histories follow. Studies of the Lincoln Telephone & Telegraph Co. and Itel Corp. demonstrate the approach to turnaround management. A look at the Angeles Corp. shows how start-up management was accomplished.

Lincoln Telephone

About 80 years of age, the Lincoln Telephone & Telegraph Co. of Lincoln, Neb., is a sparkling example of Middle America's catch-up infatuation with contemporary data processing technology.

Here is a medium-size utility that offers local and long-distance services to 22 counties in southeastern Nebraska. Here's a regional firm that serves some 190,000 customers and 360,000 instruments. Here's a company whose data processing organization progressed in just a few years from operation of a semiarchaic batch-oriented accounting system to modern-day, on-line processing of customer and stockholder records, toll settlements (a major source of income) and sophisticated business management tasks from what-if modeling to inventory control.

Yet in 1977, the DP outlook could not have appeared less promising. Lincoln Telephone's management — including Vice-President and Controller Laurence Connealy — had earlier recognized that the company's accelerating growth was demanding new and better ways to handle customer orders. "At that time," Connealy told us, "it took 3½ days to install service from the time a customer placed an order."

That was unacceptable to a firm that prided itself on service improvements and hold-the-line costs. So it attempted — starting in 1975 — to develop and implement a new computer-based order processing and billing system it called Cars (for Customer Automated Records System). It anticipated that Cars would be followed by other major DP developments.

But things didn't go according to plan. Off the beaten path and reflecting a somewhat provincial understanding of DP technology, the DP staff at Lincoln spent some 60



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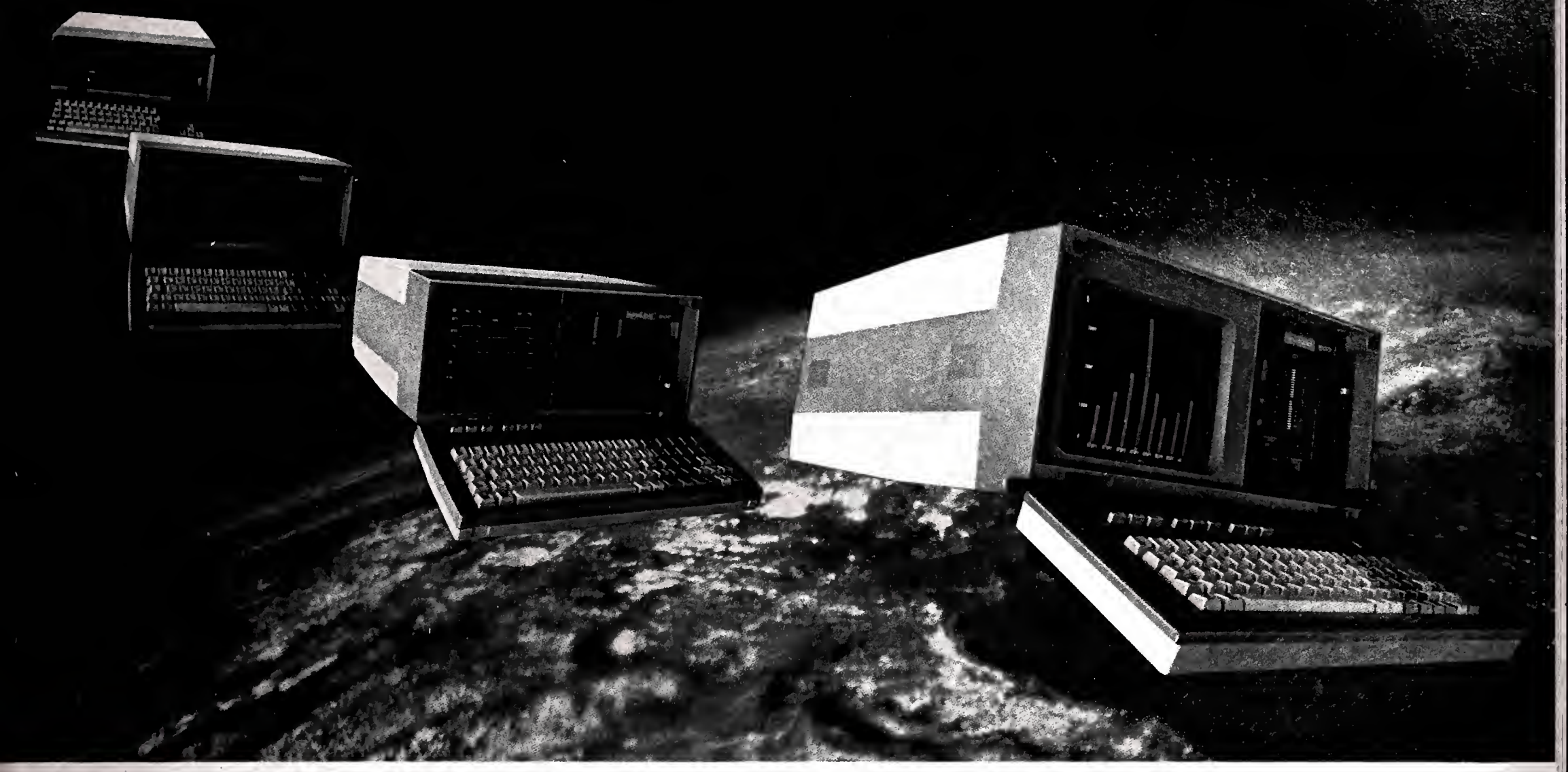
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man-months in system development, forecast the need for an additional 60 and was finally judged short on system design know-how.

Desperate to solve the growing problem, Lincoln Telephone executive management considered its alternatives: the turnkey development of Cars by an outside firm, commitment to a five-year facilities management contract or simply extensive recruiting and training. The facilities management contract — under which both equipment and data processing staff would be legally absorbed by the contractor — was a drastic solution, but it looked like a front-runner in responsiveness.

"Although the facilities management approach seemed to be a good bet, it also featured some significant drawbacks," Connealy admitted. As he now recalls it, the dominant negatives were potential cost growth, lack of guarantees on return of the capability at contract termination and the utility's definite distaste for the idea of sandwiching a separate corporate entity between the utility and its customers.

Interestingly enough, while the JIA team had termination authority, no firings were found necessary. Even the displaced manager moved into a newly created quality assurance slot.

Lincoln Telephone had heard of JIA and the turnaround management concept. It agreed to a one-year management services contract, with provisions for both cancellation and extension.

The contract's comprehensive work plan addressed the identified problems, called for the immediate insertion of qualified data processing management, defined a program to upgrade its employees and supervisors and specified month-by-month deliverables by which the utility could monitor and control the effort.

Connealy's recall is a bit more vivid. "JIA brought in five managers to run our shop. They moved our people aside temporarily, wrote standards, set up a project control system, prepared a personnel assessment and training plan and began a national search for a new DP manager."

Interestingly enough, while the JIA team had termination authority, no firings were found necessary. Even the displaced manager moved into a newly created quality assurance slot.

Steering committee

JIA also introduced Lincoln Telephone to the concept of the executive steering committee. According to Connealy, this group of top-level executives still meets quarterly to review DP status and proposals.

From the JIA viewpoint, the effort represented a repositioning of the data processing department and the turnaround of an intolerable situation. When the consultants went in, DP facilities could almost have been described as chaotic. Salaries lagged behind the industry, and morale was low.

When JIA left, about five years of learning had been jammed into one year; each employee had a prescribed route to education and advancement. And executive management had begun to understand and pay attention to the data processing operation.

Lincoln Telephone also whipped the order processing problem. With Cars, more than 50% of Lincoln Telephone's service orders are actually filled the day the order is received or, in the case of orders placed late in the day, within 24 hours.

Itel Corp.

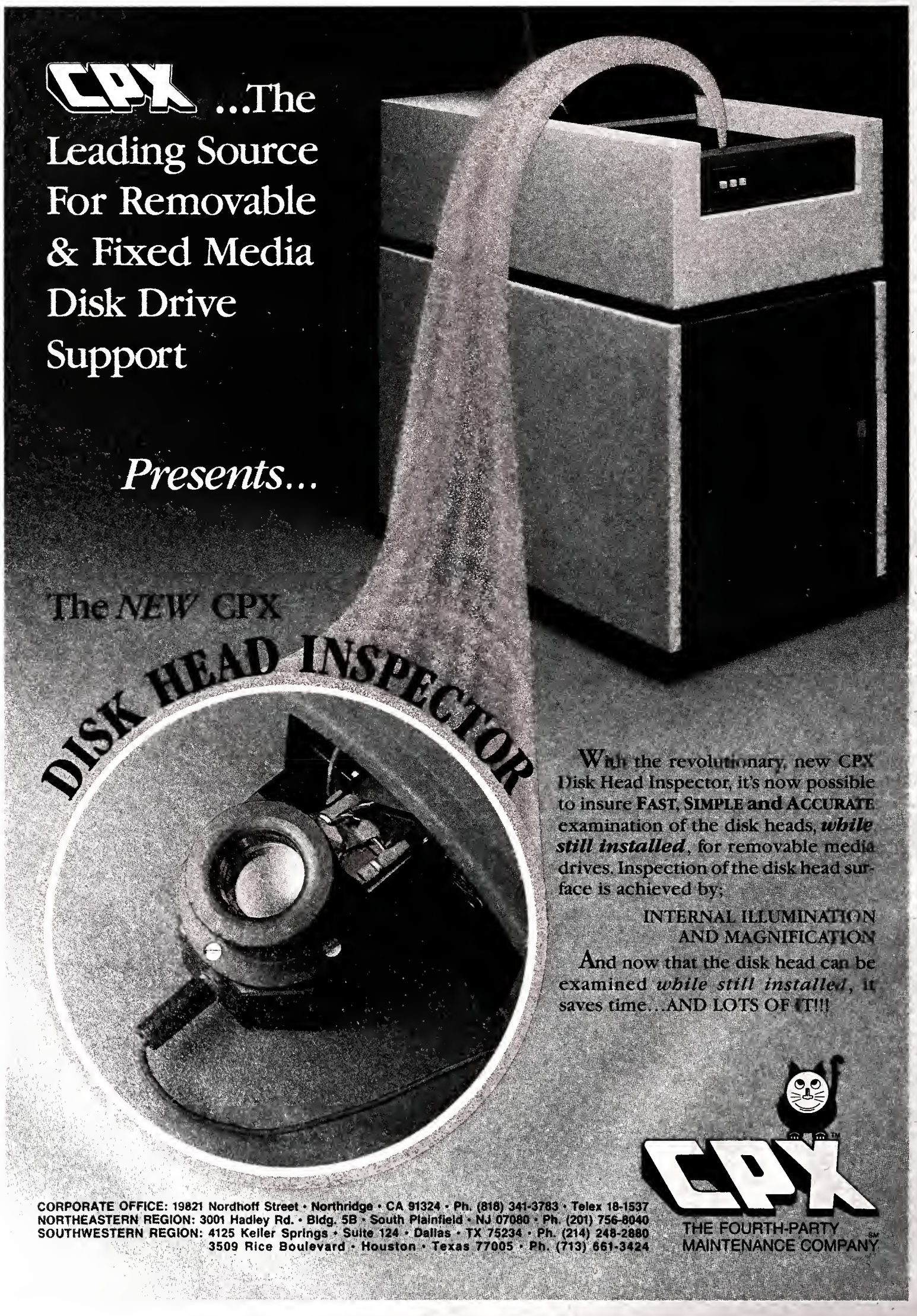
Founded in 1967, San Francisco's Itel Corp. flourished in the next decade, earning Wall Street's favor for the booming revenue from the firm's equipment-leasing business — most notably in the leasing of low-cost alternatives to IBM computers.

But 1979 saw the company stagger enormously as IBM dropped some of its prices, making much of Itel's line uncompetitive. The company lost more than $400 million that year. In January 1981, it entered Chapter 11 bankruptcy.

Today, less than three years later, Itel has gained a new notoriety — this time for the apparent speed at which it has begun to recover. It has pared the number of business units from nearly 30 to only two — container leasing and rail-car operations. It cut its work force from 7,000 to 900.

Itel has installed what is considered to be a unique bankruptcy information support system — a data processing system that has, according to Itel management, contributed so much to the recovery process that it has already been marketed to at least three other Chapter 11 businesses.

However, getting that data processing system in gear was a struggle. JIA was eventually called in. William Twomey, selected to preside over the firm during the later phases of reorganization, saw the basic problem as one of politics. "When we cut back our management staff in the fall of 1982, I — being the vice-president of finance and administration at that time — inherited several departments, including the Corporate Information Systems [CIS] Department. Unfortunately, the manager of the department held strong opinions of his own about the development and sale of the Chapter 11



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Recognizing that the CIS manager's threat could have widespread impact on the struggling company, Twomey backed his own hand by planning, with JIA, for emergency management services. Sure enough, three key CIS employees quit, giving only two weeks notice.

software and threatened to quit."

Recognizing that the CIS manager's threat could have widespread impact on the struggling company, Twomey backed his own hand by planning, with JIA, for emergency management services. Sure enough, in a power play, three key CIS employees — including the manager — quit, giving only two weeks notice.

The task facing JIA was unusual in that the Chapter 11 reporting requirements were monumental. Itel was dealing with more than 50,000 creditors and shareholders. The reorganization involved 24,000 separate claims and more than 3,000 executory contracts.

Periodic documentation ordered by the bankruptcy court included statement of assets, statement of liabilities, statement of executory contracts and statement of affairs, also known as Information Schedule 1.

The computer was used to maintain a claims register, to handle mailings to the creditors and shareholders, to call for and tabulate votes on the reorganization plan and even to distribute newly issued stocks and bonds.

Primary tasks

JIA's primary tasks were to see the computer operation resume without a hitch, to improve service to the remaining operating companies, to develop an information systems strategic plan and to develop a business plan for the marketing of computer services to bankruptcy customers.

Another significant contribution by JIA has been a major reorganization of CIS. As recently as June 1983, the two operating companies and corporate headquarters were each serviced by a more or less independent section within CIS. Each group did its own development work, with a high probability of duplicated effort.

Under a department reorganization, all users are served by a unified group that offers several important new functions. A quality assurance and administration group, a business systems planning office and a customer support group were added. The small increase in total head count also accounts for a technical group concerned with network control.

In response to JIA recommendations, Itel formed a four-man executive steering committee that will soon begin to oversee CIS operations and proposed improvements.

Angeles Corp.

The Angeles Corp. is a nationwide financial services organization. Based in Los Angeles and employing about 275 people, it acts as general partner to a number of limited partnerships, investing primarily in real estate developments and motion picture productions. It also manages pension and profit-sharing funds for other corporations and for educational institutions.

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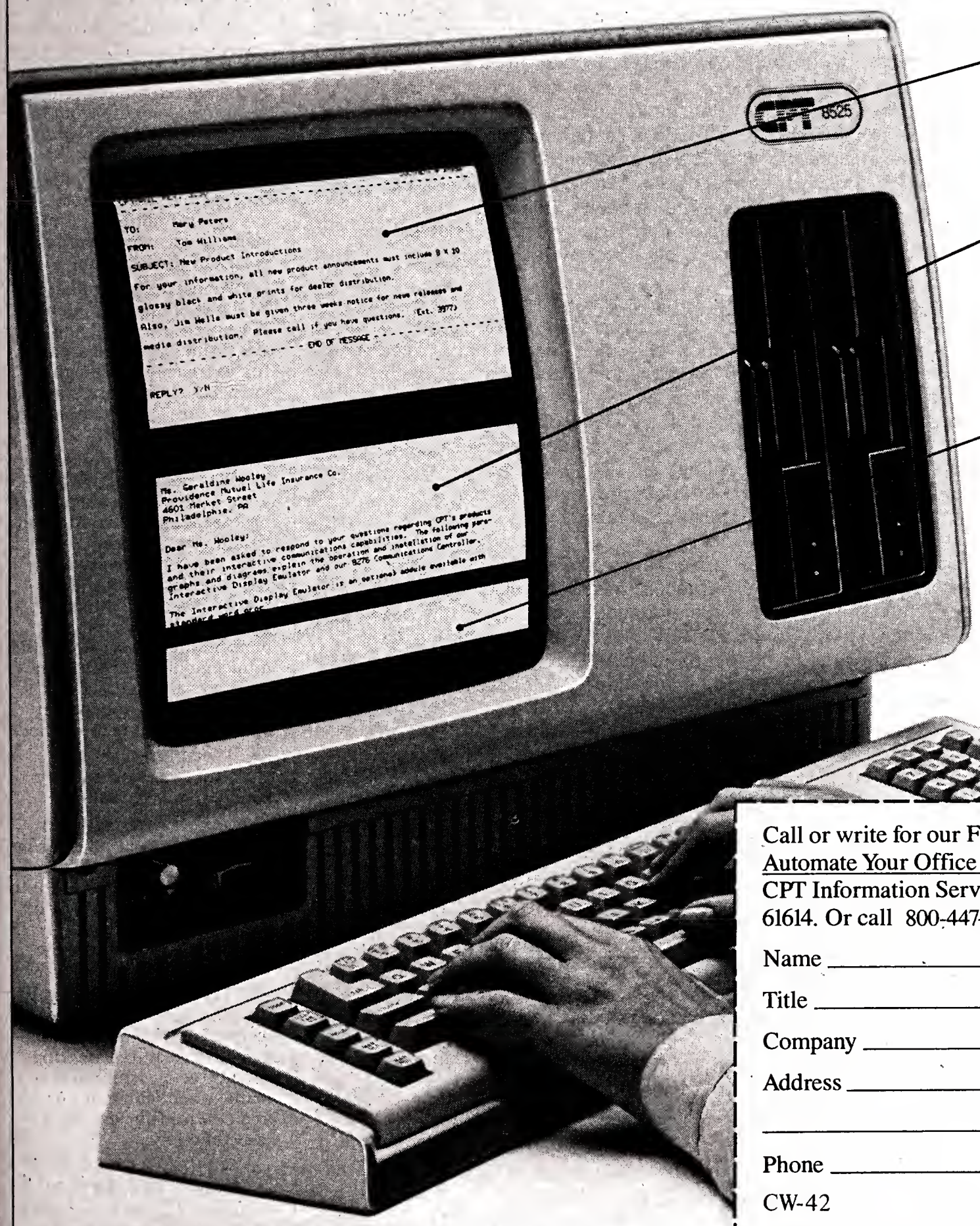
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IN DEPTH/TURNAROUND MANAGEMENT

On Angeles' behalf, the JIA team — which varied from two to five people during the contract period — evaluated equipment (eventually recommending an IBM System/38), centralized available DP resources and established a systems development methodology.

and other financial instruments soar to $2 billion from an already healthy $500 million.

Needed unified facility

But, according to Angeles President William H. Elliott, the firm had until recently been somewhat hampered by the lack of a professional, unified data processing facility.

"We were spending a good bit of money on service bureaus," Elliott said, "not too effectively, I might add. To keep up with our growth rate, we needed to significantly enhance our systems capabilities.

"I'm a great believer in systems," Elliott maintained. "And I'm convinced that data processing should be looked upon as a management tool, not simply an accounting tool."

Considered alternatives

The need for significant improvement led Angeles to the JIA group, but not before it considered a number of alternatives ranging from big-name consultants to equipment manufacturers.

"We were offered plenty of 'free' advice," Elliott recalled, also noting that most such advice usually proves costly in the long run.

"We needed a sophisticated data center, with plenty of growth potential, and knew that we faced a painful, extremely challenging job because we were starting two or three years later than we should have."

JIA started to work early in 1980, beginning with development of a strategic data processing plan. On Angeles' behalf, the JIA team — which varied from two to five people during the contract period — evaluated equipment (eventually recommending a System/38 IBM minicomputer), centralized all the available DP resources and established a system development methodology.

Cost of the new facility ran to about $2 million.

The software task was one of implementing existing applications on the firm's new hardware and designing new applications. JIA also provided an extensive amount of training for the in-house staff.

As it does in the majority of instances, JIA also recommended and helped to implement an executive steering committee by which Angeles management can monitor and control the new centralized function.

About the author

Joseph E. Izzo is president of JIA Management Group, Inc., a Santa Monica, Calif.-based management consulting firm specializing in data processing.

SCIENCE/SCOPE

NASA's Project Galileo may provide clues to the origins of the solar system when it explores the planet Jupiter later this decade. Project Galileo is scheduled to be launched from the space shuttle in May 1986 and arrive at the giant planet in August 1988. The mission consists of two spacecraft. One is an orbiter that will circle Jupiter for 20 months. The other is a Hughes Aircraft Company-built probe that will plunge into the planet's brightly colored clouds and relay data about the atmosphere. The probe is expected to operate for about 50 minutes before succumbing to temperatures of thousands of degrees, limited battery capacity, and pressures up to 10 times that of Earth's at sea level. Because some scientists believe that Jupiter's atmosphere is a sample of the original material from which stars are formed, the probe's findings will be closely studied.

A prototype electronic map developed for the U.S. Air Force makes map reading as simple as pushing a button. The Airborne Electronic Terrain Map System stores digitized terrain data to provide a moving, color-coded computer map of the area over which an aircraft is flying. The map can be projected on standard color or black-and-white cockpit displays or on the head-up display. Like paper charts, the Hughes map can show the aircraft's actual postion or be "unfolded" electronically to let the pilot look ahead. It can be presented in a shaded relief plan view, much like a standard paper chart, or in a perspective view as though the pilot were looking at terrain ahead of the aircraft. Tactical symbols can be selectively added to reduce clutter and improve display readability.

Extremely sensitive high-speed photodetectors, key components in microwave fiber-optic communications links, have been fabricated by Hughes research scientists. The devices are gallium arsenide Schottky barrier type photodetectors. They have demonstrated a flat frequency response to at least 20 GHz and have the potential to approach millimeter wavelengths. They also have quantum efficiencies as high as 70%, roughly a 2 to 5 db improvement over existing high-speed detectors.

Two broadband gallium arsenide field-effect transistors, operating in the 13- to 15-GHz frequency range, have been introduced by Hughes for use in satellite communications. The new single-cell and dual-cell power transistor chips are mounted on internally matched chip carriers and are guaranteed to operate in a 50-ohm system over a full 2-GHz bandwidth with no additional matching. The chip carriers are compatible with 25-mil alumina microstrip circuits and have 25x1-mil gold ribbon leads. The single-cell device is rated at 0.5 watt minimum output; the dual-cell at 1.25 watt minimum. Highest output is from 14.0 to 14.5 GHz.

Hughes is seeking engineers to develop advanced systems and components for weather and communications satellites, plus the Galileo Jupiter Probe. Openings are in applications software development, data processing, digital subsystems test, microwave/RF circuit design, power supply circuit design, component engineering, GaAs design, digital communications, signal processing, spacecraft antenna design, system integration test and evaluation, and TELCO interconnection. Send resume to Ray Bevacqua, Hughes Space & Communications, Dept. S3, Bldg. S/41, M.S. A300, P.O. Box 92919, Los Angeles, CA 90009. Equal opportunity employer.

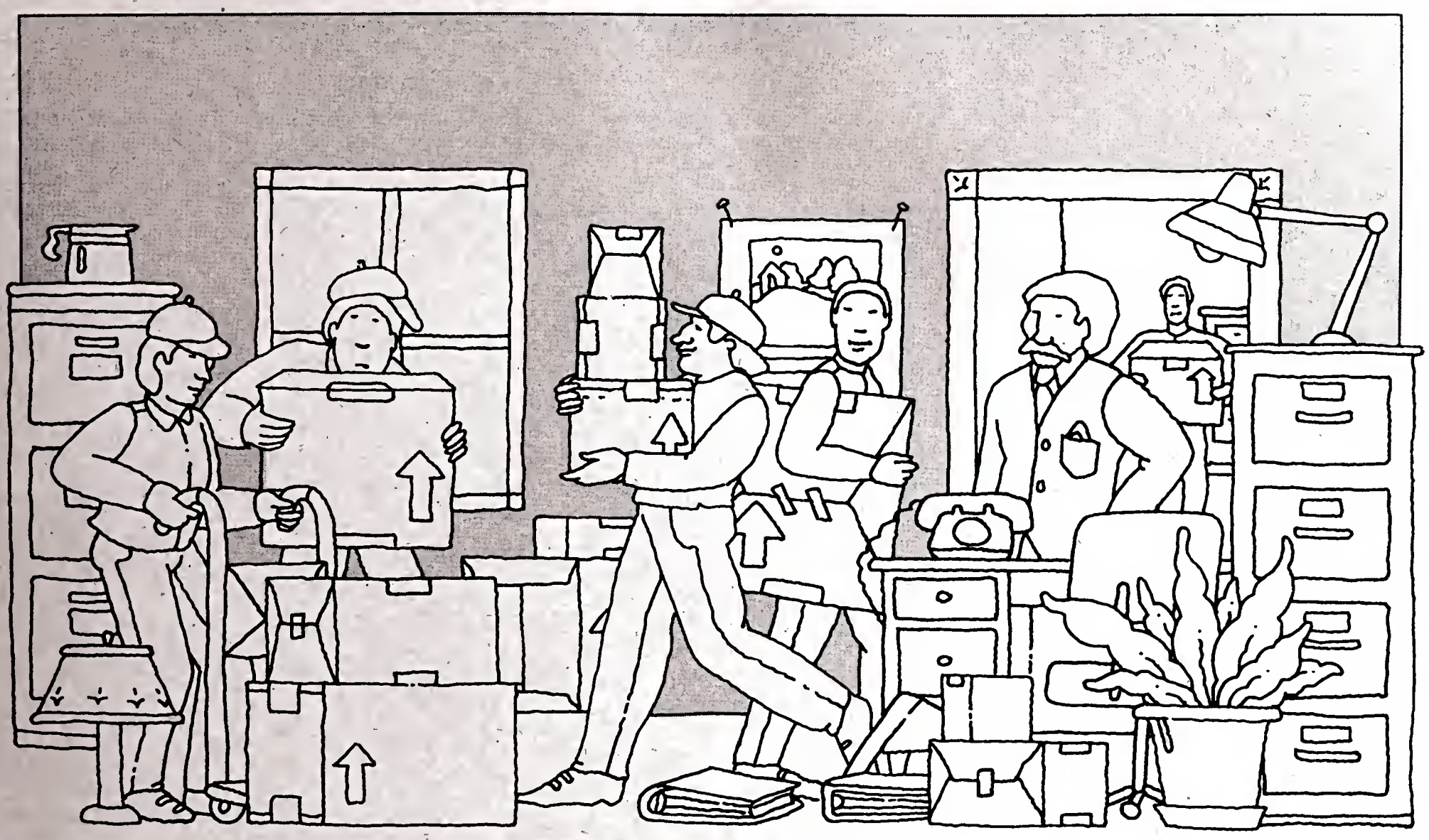
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IN DEPTH



OA forcing organizational change

By Leon Jackson

Most large companies are in the midst of planning for office automation, and yet they often overlook significant organizational issues. Resolving these issues usually involves political and cultural factors, the kind that cannot be handled by middle management. Top management should be involved in directing the office automation planning process.

Before the full benefits of office automation tools can be achieved, an organization must change in two distinct ways: first, in the "supplier" organization, which is the group responsible for implementing and managing office automation facilities, and second, in the user organizations.

Although fully integrated office automation systems are not yet available, many of the component pieces are now being purchased and implemented. To avoid risking this investment, most large organizations should plan now for fully integrated systems. These systems will combine the technologies of data processing, office systems and telecommunications.

Since fully integrated systems will eventually affect the majority of white-collar workers, human factors issues cannot be overemphasized. Education and training are vital. Physical offices will also change as the new technologies are implemented, thus bringing the building facilities' organization into the process.

There are very few large organizations in which data processing, office systems and telecommunications report to an individual below the level of chief operating officer or chief executive officer.

Data processing is often the responsibility of

The new streamlined organizations will benefit from a reduction in clerical and administrative chores that all levels below executives have to perform. We will all spend much less time searching for information and for people.

the chief financial officer. Office systems have developed under many vice-presidents of administration. Telecommunications functions are often split, with data communications in the data processing department and voice communications in some other area.

Training, with the exception of data processing personnel, is usually the responsibility of human resource departments. For a large organization to implement an effective integrated office automation system, all of these functions need to be brought together under a single executive.

Data processing people developed their own languages and set themselves up as high priests of data; they separated themselves from the user in order to maintain the integrity of the data.

These functions are not independent of each other. They are all part of information management, which is an area of growing importance as companies recognize that they are now in the information age.

Outdated distinctions

The distinctions between data, text and voice are a legacy. Data processing was kept separate from the other two because of the high level of technical skill required to program and operate computers.

Data processing people developed their own languages and set themselves up as high priests of data; they separated themselves from the user in order to maintain the integrity of the data.

In the office environment, word processors grew up as extensions of typewriters managed by office administration personnel, who were very often independent of data processing. The voice communications area, based upon its history of regulated service, maintained its own individuality with little connection to the other forms of information.

Changed environment

How different things are today. Microcomputers are proliferating throughout the organization at an incredible pace, following on the earlier, though less dramatic, success of on-line computing. Data processing people, who initially resisted the personal computer, now recognize its importance as a way to extend the capability of the computer to the user.

Word processors have been extended in capability: first to allow communications between word processors and then to add data processing capabilities leading to the first multifunctional systems.

Data communications systems have developed to allow high-speed data transfer between devices. In the area of local-area networks, they can respond to the ever-increasing needs of communicating terminals.

In the telephone area, the private branch exchange switch is now a fully integrated voice data system; no longer can it be considered as independent of data processing and office systems.

The establishment of an information management organization is the only way to coordinate the activities of these information management functions.

It is a difficult task to restructure an organization. Top management must be convinced of its importance. Justifying comprehensive office automation systems is difficult.

During the planning process, companies try to project the amount of hard-dollar savings. Other justifications include productivity improvements and strategic implications.



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One solution is to establish a new organization to handle all the information management aspects. The title for the head of this new department would be chief information officer or information resource manager.

A major goal is to demonstrate to senior management the importance of office automation to the future of the organization. Unless management is convinced of the value of improved information access and communication, it will not support the type of organizational changes necessary.

Political implications

There are considerable political implications. For example, which should be the surviving organization? Should it be one of the present organizations, such as data processing or office administration? In some organizations, the political difficulties have been so great that the responsibility has been given to the human resource department.

One solution is to establish a new organization to handle all the information management aspects. The title for the head of this new department would be chief information officer or information resource manager.

Another important question concerns to whom this new organization should report. Traditionally, it would report to the chief financial officer, but a strong case can be made for establishing this position at the executive level, directly reporting to the chief operating officer. If this is done, then a clear message is given to everyone in the corporation of the importance of information management.

The new organization has advantages that go beyond the implementation and management of the integrated office automation system. Many large corporations have diverse and autonomous business units that reserve for themselves major decisions on equipment purchase and systems architecture.

The information management organization should provide a strong leadership role to set standards by which all parts of the corporation can implement systems, while at the same time providing compatibility for communications and information transfer.

The central organization should also be responsible for listing preferred vendors, providing education and training, determining justification criteria and ensuring information security and integrity. The leadership and management skills required to cover such a wide range of issues can only be handled by a well-focused organization supported by top management.

User organizations

Office automation provides a set of tools to improve the effectiveness of people performing office-related work. Ultimately, this will apply to all levels of the organization, from senior executives to clerical employees. Initially, clerical and professional employees will benefit, followed by managers and then executives. These tools will provide significant improvements in the following areas:

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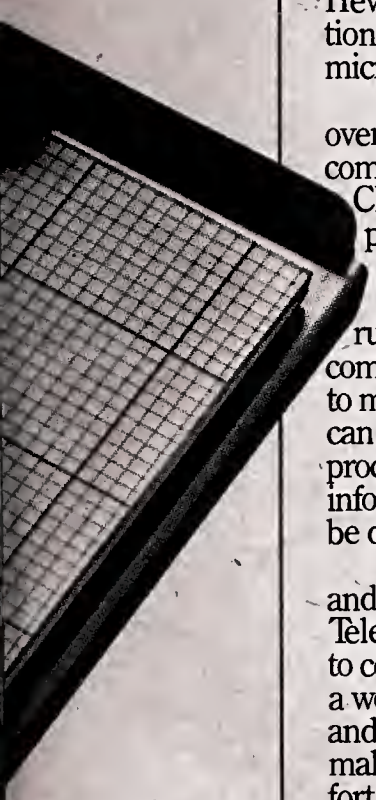
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These tools will be used in various ways by different levels of the organization, but they will all improve the way information is accessed, processed, communicated, stored and retrieved.

Technology allows us to improve the effectiveness of these information management functions and, therefore, to reconsider the way the organization is structured once the technological tools are implemented.

Sole purpose

In all organizations, there are departments that exist solely for the storage and retrieval of information. An example of this is a department that stores information on the Environmental Protection Agency rules and how they are implemented in each state.

The individuals who work in this department do not process or analyze the information; they act merely as custodians and retrievers of the information upon request. Once the technology is available to provide this information, these people can be reassigned.

Another example concerns the answer to the question, "What does your department do?" In many cases, the response is to describe the process that the individuals go through, rather than describing the actual work product of that department.

People in offices think in terms of processes rather than a product. Yet each department has at least one product that is provided to another department. An example might be an engineering department's products, which are provided to manufacturing engineering in the form of drawings, part lists, test specifications and component specifications.

Classical approach

The classical approach to automation is to automate the process by which these products are produced, rather than to go to the internal customer, the user of the product, and ask him how the product could be improved. Then, by working with the engineering department and encouraging it to produce a better product, the productivity of that department can be improved in a real sense.

Concentrating upon the process could, on the other hand, lead the engineering department to produce a bad product more effectively. The processes should be changed, often requiring organizational changes.

An even more significant example is the potential effect on middle management. We hear constantly about how much more efficient Japanese companies are. There is always talk about reducing middle-management bureaucracy in order to improve efficiency. Office automation tools provide a mechanism for doing just that.

Vertical structure

If you consider a typical organization chart in a large structured and bureaucratic organization, you readily notice the vertical nature of the structure. Let us consider Manager A who has a whole series of people reporting to him to support the office information functions for which he is responsible. Manager B also has a vertical structure reporting to him to handle his area of responsibility.

If an individual working deep down in Manager A's department needs information from a peer in Manager B's department, he may have some informal method of obtaining that information by telephoning or meeting with his source.

However, if he is to use this information officially, he is required to pass his request up the ladder to Manager A, who requests the information from Manager B. Manager B sends the instruction out to the source, who responds up the ladder to his manager. Manager B reviews and approves the information and hands it to Manager A, who will then send it down his chain of command to the person who requested it.

This sounds ridiculous, but in many cases this process is absolutely necessary if the information is to be reliable and approved within the structure of the organization.

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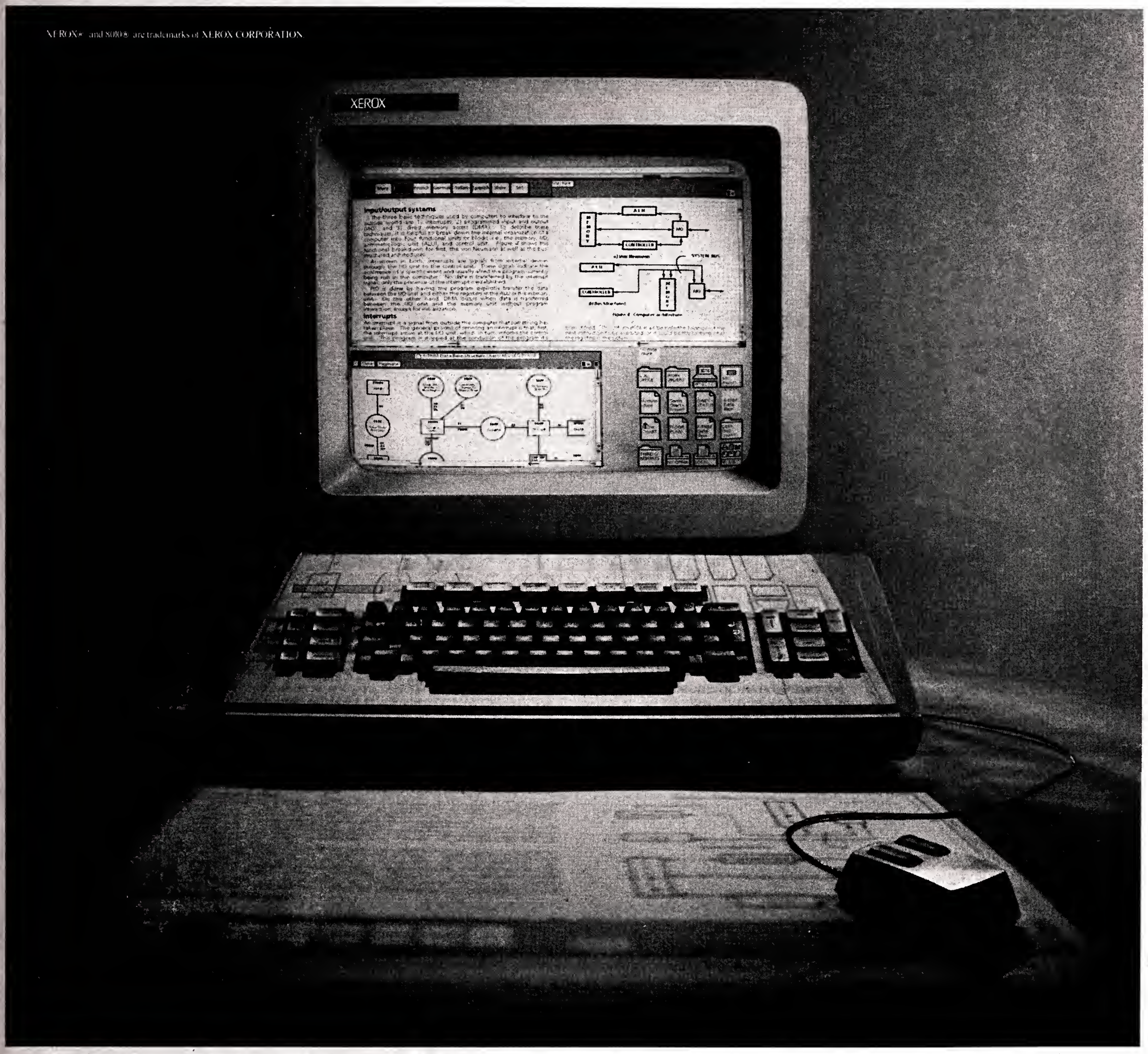
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When part of an Ethernet network, the Star can work with a wide array of word processors, mainframes, personal and business computers, printers, electronic mail and file services, facsimile terminals, communicating Memorywriters, other networks and, of course, other Stars. It also provides 3270 and TTY emulation.

Its full 17" bit-mapped screen lets you view two full pages simultaneously and open up to six documents at a time without covering up a previous document.

It's also the only workstation that can create and print documents in more than a dozen languages, including Russian and, for the first time, Japanese (Katakana, Hiragana and Kanji).

While other workstations may use Xerox innovations like the mouse, icons, windows, property sheets and combined text and graphics, the Star simply does more with them.

For example, the Star's extensive software is fully integrated, to allow you to work with text and graphics simultaneously. You can draw a flowchart right in the middle of a full page of text without having to resort to a separate program and limited buffer "scratchpad" or "clipboard."

In terms of capabilities, ease of use and overall value, the Star would have to be considered the stellar workstation in the industry.

situation once an effective office automation system has been implemented. The information will be contained in a data base. Access to the information will be limited to those people who have the authority for its use.

It will not be placed in the data base until it has the approval of Manager B. Manager A knows that if his employee uses this information then it has gone through all the validation procedures specified by Manager B's department.

Thus, corporate departments can access information from business units. On the other hand, business units can have access to corporate human resource policies without going through extensive chains of command.

If it is necessary for one business unit in a diversified corporation to enter the market in a foreign country, then it will be possible for the vice-president of marketing to learn the extent of involvement of other business units already doing business in that country.

This information will further improve communication between departments that today are somewhat artificially separated.

The new streamlined organizations will benefit from a reduction in clerical and administrative chores that all levels below executives have to perform. We will all spend much less time searching for information and for people. The number of meetings called purely for information-gathering or progress-reporting purposes will be drastically reduced. We will go a long way toward eliminating telephone-tag problems.

Managers will have more time to make decisions and for planning. Professionals will have more creative time to process information and to evaluate the results of their work. More time will lead to more thoughtful analysis, better planning and better information for making decisions.

Clerical people will be provided with the necessary tools to support professionals, managers and executives in meaningful ways that improve "management-clerical team" effectiveness and make the clerical job more interesting and valuable.

Different organizations

Clearly, fast-growing or changing organizations will benefit more quickly from the implementation of office automation systems. They can use office automation tools to help them build an organization to meet strategic goals.

A current example of a rapidly changing industry is the financial services industry, in which banks, stockbrokers, insurance companies and major retailers are making extensive use of office automation technologies in the battle for market share.

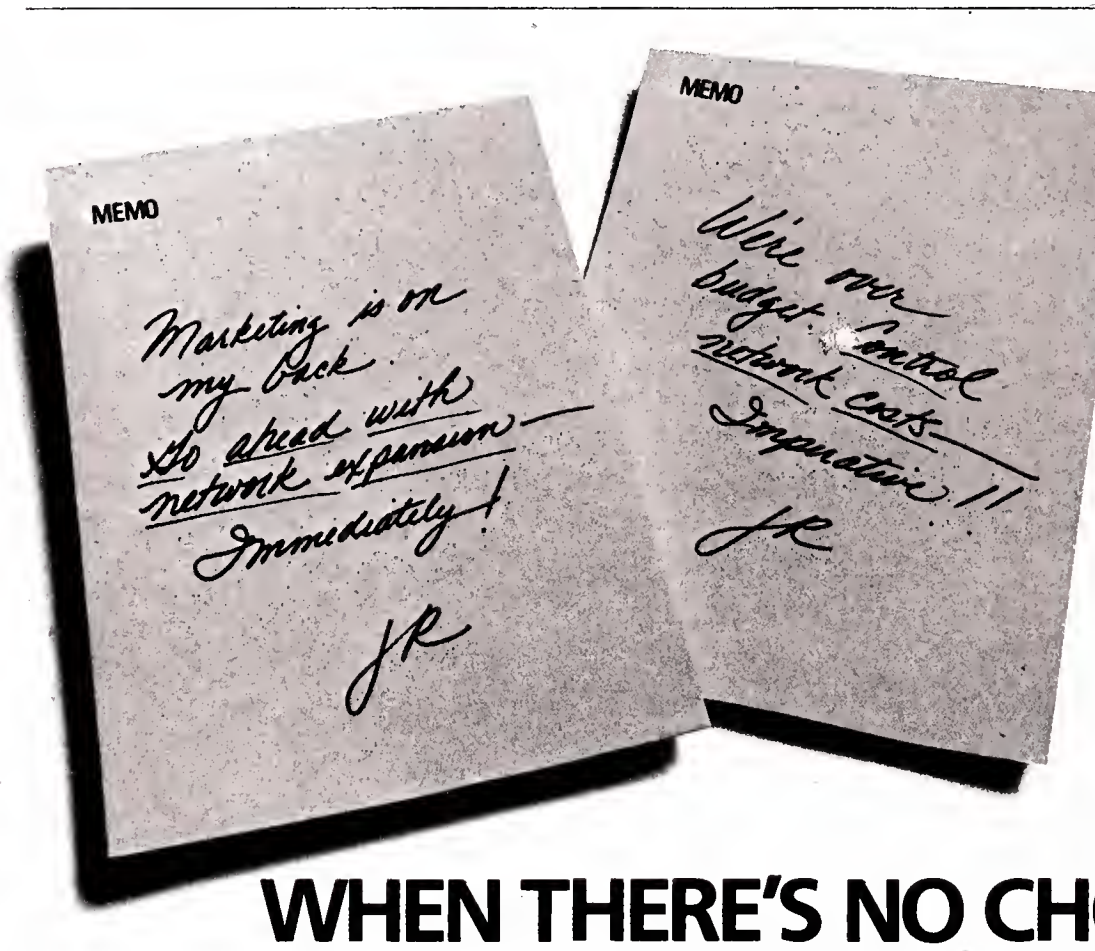
Major manufacturing companies, recovering from the recent recession, are implementing office automation tools in an effort to keep their organizations lean as the economy improves.

Even some of the more staid and conservative industries are finding significant advantages to office automation. Electrical utilities now under severe pressure because of criticism of their atomic power stations are using office automation tools to ensure accuracy of reporting information to regulatory bodies. Commodity chemical companies are using these modern technologies to improve their competitive positions by placing terminals directly in customers' locations for on-line ordering and expediting services. Even government departments under extreme pressure to be more efficient and economical are making use of office automation technologies to reduce their manpower.

The rate at which the technologies are implemented will vary from industry to industry; however, the common factor that runs through them all concerns the changes that must take place within their organizations for them to benefit from the use of these technologies. Companies that plan for such changes will reap their benefits much faster.

About the author

Leon Jackson is a senior staff associate with the management consulting firm Arthur D. Little, Inc., located in Cambridge, Mass.



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COMMUNICATIONS

DATA STREAM
John Dix
CW Senior Editor

AT&T's 'Gazelle' expected in May

According to the grapevine, May 1 is the tentative date for the first showing of the "Gazelle," AT&T Information Systems, Inc.'s second digital private branch exchange (PBX), although a company spokesman said that date may be a bit premature.

The new switch, to be officially known as the System 75, will be the little brother to the Dimension System 85, AT&T's first digital switch, announced at the beginning of last year. It will be compatible with that switch, but, significantly, it is believed that the System 75 will have a different architecture.

The System 75 is rumored to be a single-cabinet switch capable of supporting 400 lines, as compared to the System 85, which, when not interconnected with other System 85 modules, supports 1,000 lines.

When it is first revealed, it is expected that the System 75 will lack some of the networking features of the larger switch. In particular, it is believed that initially the System 75 will only be able to work as an end point in an Electronic Tandem Network (ETN).

If this proves to be true, it would mean, for example, that an ETN configured with a System 85 in Philadelphia and linked with another one in San Francisco could not be passed through a System 75 in Chicago. Instead, the mid-continent PBX would have to be tied into the network through one of the switches on the coast.

But more important than rumored announcement dates and the fact that the new PBX might initially lack some networking capabilities are the architectural differences between the forthcoming switch and the existing System 85.

The expectations of a new architecture have, in fact, caused some users to hedge on the System 85, wondering if AT&T really intends to build its future on that architecture.

Manfred Zerbe, director of communications services at Colgate-Palmolive Co., said recently that AT&T Informa-

See **AT&T** page 99

Doelz unveils concentrator

Claims to solve common networking problems

IRVINE, Calif. — Doelz Networks, Inc. recently unveiled a multipoint concentrator switch that reportedly eliminates traditional networking problems associated with differing architectures, gateway approaches, installation requirements, network management, network diagnostics and network maintenance.

Elite One, touted as the first product in a family of data communications networking systems, is said to embody the architecture and technology that will be used in forthcoming products.

Elite One supports all traditional networking transmission media, including both analog and digital lines, at speeds up to 72K bit/sec. Data is transmitted and managed over continuous bidirectional transmission paths that are independent of transmission media, attached devices and their protocols. User ports accept multiple concurrent asynchronous, synchronous, Systems Network Architecture, Synchronous Data Link Control and X.25 protocols, the vendor reported.

According to Frank T. Conners, president and chief executive officer of the company, Elite One will enable users to operate a single network, instead of multiple networks, for varying types of traffic (for example, batch or interactive) and/or varying types of vendor-specific hardware.

"The form of the data, its protocols, the transmission media it will travel across and the system it was generated on should not be the deciding factor in network design," Conners said. "Out technology is suitable for all data communication networking requirements."

A single Elite One switching node can accommodate up to 32 users' ports with either asynchronous or synchronous protocols. Each Elite One can address up to 60 nodes.

Networks are created by tying together two nodes to form a single network link or by interconnecting a series of network links, the vendor reported. Several functions are said to be performed simultaneously: virtual switching, data traffic management, data priority, data packaging and overall network management.

Conners said that a user-programmable, multiple-priority scheme enables interactive and batch traffic to be intermixed on the network. This is achieved with a traffic optimization algorithm that gauges the priority of communicated traffic and en-

See **ELITE** page 99

Message system lets *Newsweek* eye more late-breaking news

NEW YORK — Messages are moving to and from the headquarters of *Newsweek* magazine here with greater speed and fewer foul-ups with the recent installation of a $1.5 million computer-based message-switch system, reported Bob Monterola, Newsweek, Inc.'s director of data communications.

The message switch translates the communications protocols of reports and queries coming from the magazine's 21 bureaus, mostly via teletypewriter, into the protocol used by headquarters. It also uses its store-and-forward capacity to send outgoing messages in bundles at high speed to save on long-distance charges.

The switch, installed early in January, handles most of the magazine's asynchronous data communications and, because of modifications, several bisynchronous links as well. It carries the majority of *Newsweek*'s telegrams, TWXs, telex messages and direct-dial data transmissions. It also converts protocols and meets the communications software needs of ITT, RCA Corp. and all international record carriers, Monterola said.

When it is fully phased in, the switch will link all of the magazine's New York editors directly with the bureaus via their Atex, Inc. text editing terminals. That connection will eliminate the need for bureau writers to have their reports rekeyed into a Teletype machine prior to transmission to New York.

"We were starting to die with all of those old Teletypes," Monterola said.

Bypassing the Teletypes will also eliminate the need for couriers to carry messages directly to each of the magazine's 10 floors of offices. With a circulation of three million, *Newsweek* employs more than 400 editors and reporters.

See **NEWSWEEK** page 99

Modems, data service units, terminal out from Paradyne

LARGO, Fla. — Paradyne Corp. has announced six new communications products, including three modems, two data service units and an asynchronous terminal.

The MP-192 SM is a voice-grade, 19.2K bit/sec modem with an integral, full-feature statistical multiplexer. The modem reportedly provides eight or 16 channels of statistical multiplexing with up to a 2:1 concentration ratio resulting in aggregate speeds up to 38,400 bit/sec in most applications. Its price is $16,900 with the eight-port, integrated statistical multiplexer and $18,900 with the 16-port statistical multiplexer.

The Challenger 144 is a 14,400 bit/sec modem based on a single circuit card. Its price is $4,800.

The LDM-100 is a full-duplex, limited-distance modem for unloaded, four-wire metallic circuits. Synchronous data rates from 1,800 to 19,200 bit/sec as well as asynchronous data rates between 2,400 and 9,600 bit/sec are supported. Its price is $1,100.

The DS-500 and DS-556 are data service units for use with AT&T's Dataphone Digital Service. The DS-500 accommodates data rates of 2,400, 4,800 and 9,600 bit/sec, and the DS-556 operates at 56K bit/sec. The DS-500 is priced at $895, and the DS-556 costs $1,095.

The 7811 is an asynchronous terminal that transmits data over an RS-232 asynchronous link at selectable rates from 300 to 19.2K bit/sec. Features include ergonomic design; tilt-and-swivel terminal; and a 12-in., nonglare, high-contrast CRT. It is priced at $695. Paradyne can be reached through P.O. Box 1347, 8550 Ulmerton Road, Largo, Fla. 33540.

INSIDE

Voice/Data Communications/**94**
Multiplexers/ Modems/**94**
Local-Area Networks/**98**
Auxiliary Equipment/**98**

YOU CAN ADD A SECOND IBM® 3270 PERIPHERAL IN MINUTES.



Now you can take any existing coaxial cable in use with a single controller and DOUBLE the cable's capacity immediately. Every cable that is installed can now drive two devices. That's right, TWO peripherals running over ONE cable. We call it the "**Coaxial Doubler™**".
One Doubler connects two ports of the controller to the shared cable. The other Doubler connects the shared cable to two peripherals.



A real breakthrough! The Coaxial Doubler, our littlest multiplexer, requires no external power connections and comes with a five year warranty. Installation time? Five minutes.
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IBM is a registered trademark of the International Business Machine Corporation.

COMMUNICATIONS

Ark Electronic unveils host of products

MELBOURNE, Fla. — Paradyne Corp. subsidiary Ark Electronic Products, Inc. recently announced a number of new products, including a multiplexer, two programmable interface units and a port-sharing device.

The Octamux-1 is a time-division multiplexer that reportedly connects clusters of eight nonintelligent, unbuffered terminals to their associated computer, remote concentrator, polling controller or similar device with a single, four-wire unshielded cable.

The product eliminates interface cables for clusters of terminals located up to 1 km (about 3,300 ft) from their physical port. Its price is $650.

The ICA-2 and ICA-4 are programmable communications interface units that perform speed, code and protocol conversion.

The ICA-2 is based on a Zilog, Inc. Z80 microprocessor and is available with a multiple-purpose, 4K-byte buffer, which provides the user switch-selected combinations of speed, parity and flow control and conversion between asynchronous and synchronous protocols and Ascii/Baudot codes, the vendor said. The device can be programmed by the user to meet specific applications.

The ICA-4 uses an Intel Corp. 8086 with 128K bytes of random-access memory. It can support up to 12 serial asynchronous, synchronous, Binary Synchronous Communications, High-Level Data Link Control or Synchronous Data Link Control I/O channels. Potential user-programmed applications include: protocol conversion, multiplexing, terminal emulation for dumb terminals, serial and parallel printer protocol and/or data conversion, a company spokesman said.

The price for the ICA-2 is $720; the ICA-4 costs $2,450.

The MSD-4 is a new device that is said to provide modem or port sharing in polled or half-duplex data nets.

The product operates at 14 different data rates up to 19.2K bit/sec, including all the common speeds of synchronous modems and terminals. It offers a 4-bit buffer combined with an internal/external clock option on each port, which supplies error-free handling of speed differences between any two differently clocked devices for any block length of data, the vendor said. This reportedly permits a mix of local terminals and remote multidrop lines to share the same computer port.

The price is $795.

Ark Electronic Products is located at 325 W. Hibiscus Blvd., Melbourne, Fla. 32901.

VOICE/DATA COMMUNICATIONS

TELESAVER, INC.
Quick Call 2000

Telesaver, Inc. has announced the Quick Call 2000 autodialer featuring speed dial, memory storage and retrieval and least-cost routing.

With the autodialer, one to 24 users can access alternative long-distance services by dialing only two- and three-digit numbers. The system operates with single-line telephones, key systems and private branch exchanges and works with AT&T and other common carriers as well as international calls, the vendor said.

Features of the product include the ability to store and speed-dial up to 250 local and long-distance numbers; the ability to determine which subscribed common carrier offers the least expensive service for a particular call; the ability to redial a call until completed, with information entered one time only by the user; and a cost accounting feature for billing by person, department, cost center or client, according to a company spokesman. The price for a one-line unit is $455.

Telesaver, 20 Gwynns Mill Court, Owings Mills, Md. 21117.

MULTIPLEXERS/ MODEMS

LOCKHEED-GEORGIA CO.
Data Sentry

The Getex Division of Lockheed-Georgia Co. has introduced Data Sentry, a modem that can reportedly prevent data theft and other security breaches of personal, mini and mainframe computer systems without requiring encryption or changes in systems programming.

The asynchronous modem operates full duplex at 300 or 1,200 bit/sec and has autodial, autoanswer, autospeed and autoparity selection. Terminal interface is a standard RS-232C cable. The telephone interface is a single telephone number drop with an RJ-11C connection. The price is $895.

Lockheed-Georgia, Dept. 8402, Zone 18, Marietta, Ga. 30063.

COHERENT COMMUNICATIONS SYSTEMS CORP.
SPM-94B

Coherent Communications Systems Corp. has introduced the SPM-94B simultaneous voice and data dial-up modem, a device that enables a full duplex, 300 bit/sec asynchronous data stream to be carried simultaneously on a switched telephone line carrying a voice conversation.

A telephone line and local telephone set are plugged into the unit's dual RJ-11C telephone input jacks,

Continued on page 98

David
Recommends The Diablo 630 Series

David Jamison Carlyle recommends the Diablo 630 Series.

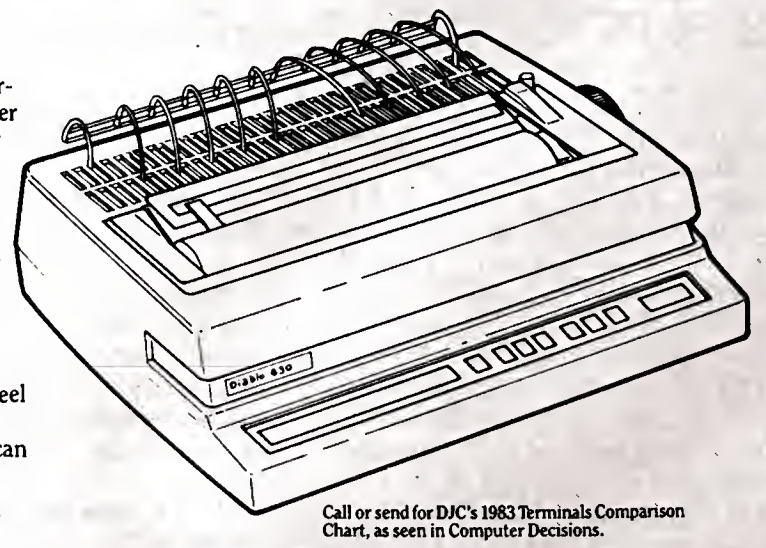
The most versatile line of daisy wheel printers for serious business applications.

630 API—The API's unique all purpose interface makes this 40 cps printer compatible with almost any computer you can name.

630 ECS—All the features of the 630 API plus the ability to print 192 fully formed characters and construct hundreds more. Perfect for scientific, financial, legal and other applications where special symbols and text are needed.

630 ECS/IBM—The only daisy wheel on the market that can truly print any character or symbol that the IBM PC can display.

Diablo from DJC, the first name in peripheral distribution.



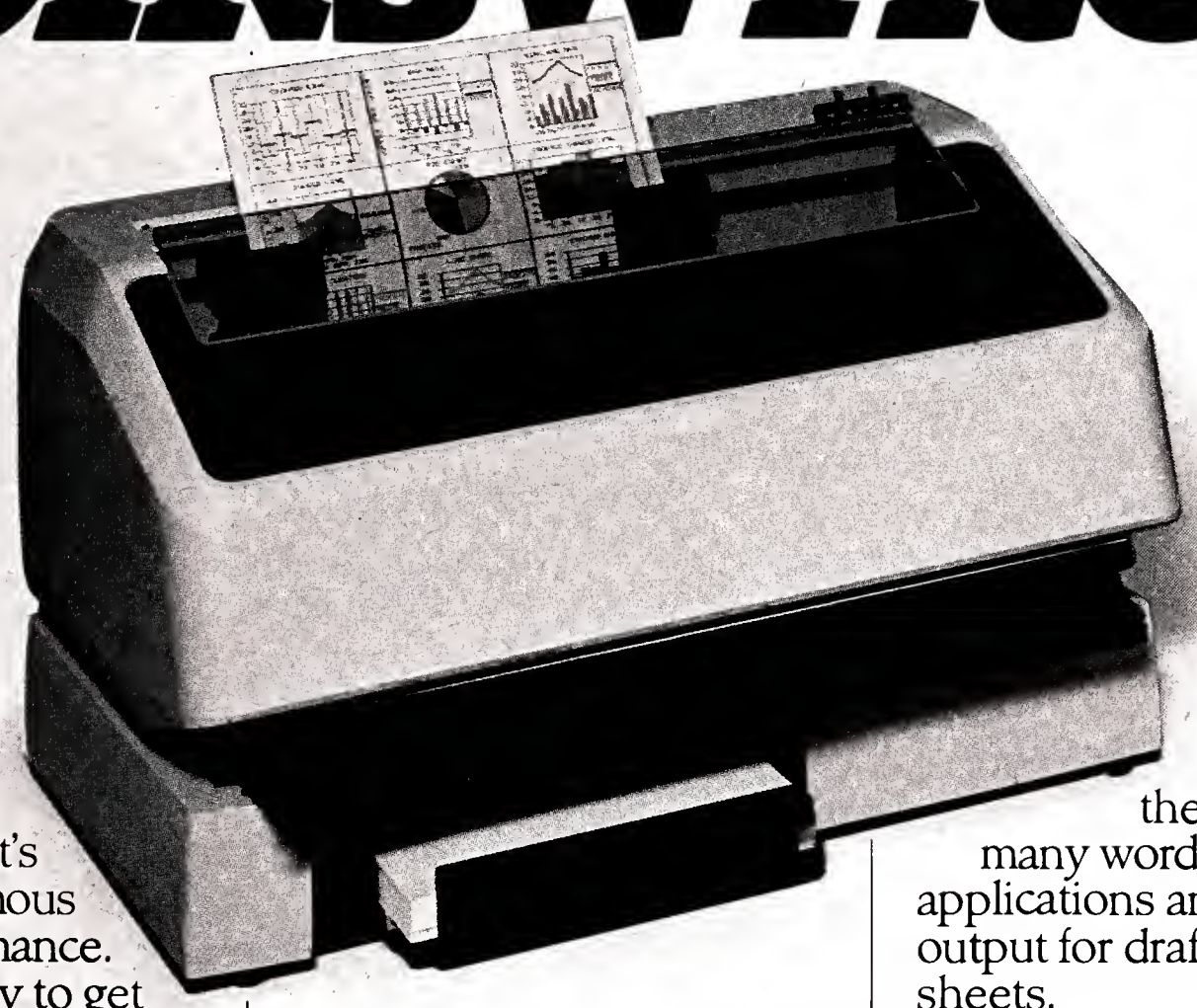
Call or send for DJC's 1983 Terminals Comparison Chart, as seen in Computer Decisions.

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THE DAVID JAMISON CARLYLE CORPORATION

Soup up your Volkswriter.®



Everybody knows Volkswriter,® the word processing software package that's become synonymous with high performance. Now, there's a way to get even higher mileage out of your Volkswriter. Hook it up to a Dataproducts P Series dot matrix color printer.

The versatile P Series translates the executive class, word processing capabilities of the Volkswriter into brilliant full color charts, graphs and text. It delivers a full page of text quality correspondence quality output for the Volkswriter's many word processing applications and high speed output for draft and spreadsheets.

print in nothing flat while its sheet feeder automatically prevents loading hassles. And the P Series uses pin feed or plain paper and has the brains to fill every appropriate line with crisp, sharp copy, even if it has to justify to do it. And the P Series color printer has dual speed capability for

The Dataproducts P Series color printer. Think of us as a supercharger for your Volkswriter.

For more information go to your nearest computer store and ask about the Dataproducts P Series color printer, or call Dataproducts, 1-800-258-1386.

Dataproducts computer printers

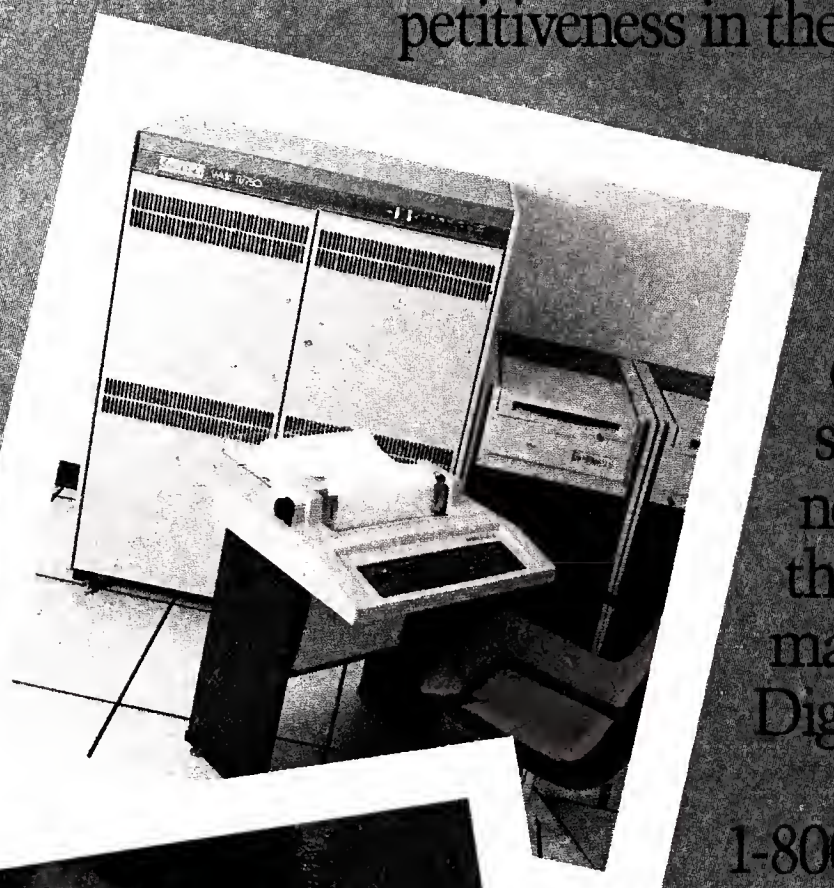
Nobody puts ideas on paper so many ways.

Volkswriter is a registered trademark of LIFETREE SOFTWARE, INC.

Agriculture is an extremely dynamic marketplace," says Larry Wergin. "To service it you need a flexible, quick and highly responsive information system. With VAX™ computers, we're building such a system, and even better, doing it in stages."

"We're starting with RMS, forms management, and communications via DECnet,™" he explains. "We're putting all our batch operations on-line. As our needs and marketplace change, we'll keep adding to this library of services. We'll eventually build a model of our entire business based on Digital's information management products."

Larry believes that VAX information management software is integrated around the operating system better than any other vendor's. "It's a tremendous foundation to build on," he says. "It presents no limits on our ability to tailor services on an individual basis. This may very well be the key to our competitiveness in the future."



The nine Land Banks asked Digital to look into the future. "We tried to look ahead as far as twenty years," Larry recalls. "We imagined a day when this network could be used to offer farmers full financial services—right in their hometowns. We needed a vendor who would be there when that day came. I don't think there will be many. But with products like VAX, I'm sure Digital will be one of them."

To grow along with VAX, call toll-free: 1-800-DIGITAL, extension 200. Or write: Digital Equipment Corporation, 200 Baker Avenue, CF01/M94, West Concord, MA 01742.



"WITH OVER 450,000 FARM LOANS, WE PICKED VAX BECAUSE IT KEEPS ON GROWING."

—Larry Wergin, Director, [illegible] Land Bank Data Processing Center

Nine of the regional Land Banks of the nation's largest agricultural real estate lender, the Farm Credit System, are building a VAX-11/780-based network to link up with their National Data Processing Center. The network's first task is to improve services to the borrower by providing up-to-date information to hundreds of associations across the country.


VAX
digital

COMMUNICATIONS

Continued from page 94

and a data terminal is connected to the modem via an RS-232C/CCITT V.24 interface.

Once a dialed connection is made, an on-line button is pushed to initiate transmission.

Typical applications of the SPM-94B include electronic blackboards, teleconferencing, field-service communications, help lines for data or word processing systems and business and personal computer networks, according to the vendor.

Five front-panel LED indicators monitor the operation of the unit for system diagnostics, the vendor said. The price is $570.

Coherent Communications Systems, 60 Commerce Drive, Hauppauge, N.Y. 11788.

KINEX CORP.
2400/FDX

Kinex Corp. has announced the 2400/FDX modem intended for full duplex synchronous and asynchronous data transmission at rates of 1,200 and 2,400 bit/sec over two-wire switched or leased lines.

Standard features of the modem include automatic answer/disconnect, automatic rate recognition, transmission status and line signal quality indicators plus internal and remote-controlled digital loopback testing. The price is $1,695.

Kinex, 6950 Bryan Dairy Road, Largo, Fla. 33543.

LOCAL-AREA NETWORKS

ABLE COMPUTER
Easyway/ET

Able Computer has announced Easyway/ET, an Ethernet network controller for Digital Equipment Corp. Unibus PDP-11 and VAX computer systems.

Compatible with IEEE 802.3/Ethernet networks and TCP/IP protocols, the latest product in the Able Computer Easyway line consists of two modules: a Host Protocol Processor (HPP) and a Communications Adapter Board (CAB).

The two modules combined make one complete controller. The HPP module contains the Unibus interface, data line interface and TCP/IP protocols. The CAB provides the data link and physical layer protocol to the 802.3/Ethernet network. It mounts on the HPP as a plug-in module.

Easyway/ET software device drivers are provided for the DEC VMS and RSX operating systems. Supporting layers one through four on the network architecture, Easyway/ET off-loads the host CPU.

The price of Easyway/ET is $7,200. The product will be available for shipment in mid-summer.

Able Computer, 1732 Reynolds Ave., Irvine, Calif. 92714.

CONCORD DATA SYSTEMS, INC.
Token/Net

Concord Data Systems, Inc. has announced its Token/Net local-area network, which the company said is the industry's first local network to meet the IEEE 802.4 token-passing standard approved last September.

The product uses the token-passing access method and a broadband, CATV-type physical medium.

The price is $500 to $850 per port, depending on configuration. A four-port box costs $3,485; a 10-port box costs $5,500.

Concord Data Systems, 303 Bear Hill Road, Waltham, Mass. 02154.

AUXILIARY EQUIPMENT

XYPLEX, INC.
Optical-fiber link for Xyplex

Xyplex, Inc. has announced the addition of optical-fiber transmission capabilities to the Xyplex system, which allow the user to link various coaxial cable segments together with optical-fiber cable.

Coaxial systems in buildings within a 1 km area can be connected using the optical cable. The physical configuration of the link is a point-to-point cable with a coaxial-to-fiber interface unit at each end. Multiple interface units can reside on any coaxial cable segment, according to a company spokesman.

The price is $3,200.

Xyplex, 100 Domino Drive, Concord, Mass. 01742.

AVANT-GARDE COMPUTING, INC.
Net/Guard

Avant-Garde Computing, Inc. announced recently the Net/Guard system to monitor and control access by personal computers to central networks, data bases and computers.

The product reportedly connects any dial-up device to the network, regardless of protocol, and controls access to data bases and applications through use of multilevel passwords. The system monitors, measures and analyzes current and historical status, performance and utilization of dial-up devices attached to the network.

Net/Guard provides three types of alerts to network operators: security, equipment failure and time-threshold alerts. Consisting of front-end processor interfaces, system control unit, user interfaces, modems, analog patch panel, color monitor, printer, disk storage and tape backup, prices for the system begin at $200,000, according to the company.

Avant-Garde Computing, 2091 Springdale Road, Cherry Hill, N.J. 08003.

NOW CCA'S MODEL 204 DBMS CAN DO SOMETHING EVERY EXECUTIVE CAN APPRECIATE.



Timeplex protocol converters debut

Timeplex, Inc. has announced Tru/Blu, a line of protocol converters that offer networking ability to personal computers, multiple hosts and mixed computer types.

The series, comprised of four protocol converters, reportedly performs conversions between synchronous Ebcdic and asynchronous Ascii data characters, between different speeds and between coaxial cable and RS-232 interfaces. They also perform switching functions that permit one terminal or printer to work with two or more host computers of different kinds, according to the vendor.

The four protocol converters and their features include:

■ Tru/Blu 74 — which emulates an IBM 3274 terminal cluster controller, has 10 RS-232 ports supporting up to nine Ascii terminals (each with one individually addressable printer) and up to two synchronous lines connecting to one or two IBM 3705 front-end processors. Prices start at $3,900.

■ Tru/Blu 78 — which allows a personal computer or asynchronous terminal to switch between full screen emulation of an IBM 3278 terminal, via a coaxial cable, and a minicomputer or modem. The device costs $1,695.

■ Tru/Blu 87 — adapts an Ascii printer (RS-232 serial or Centronics Data Computer Corp. parallel) to the coaxial cable of the 3274 cluster controller and emulates the IBM 3287 and 3289 printers. The price is $1,975.

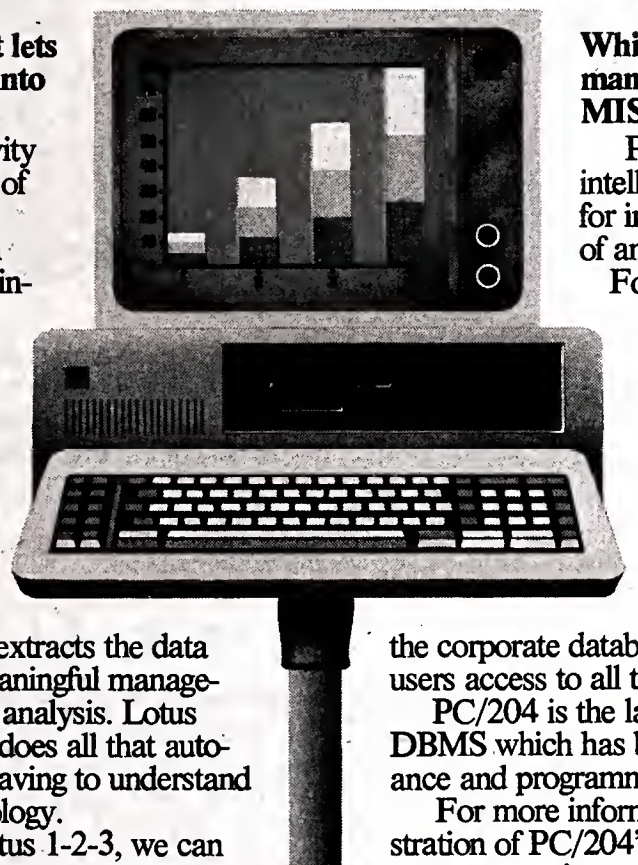
■ Tru/Blu 80 — emulates IBM 3780, 2780, 2770 and 3741 (bisynchronous) protocols using an asynchronous terminal and an Ascii printer. It supports remote job entry or batch terminal functions and, in reverse, allows an asynchronous minicomputer to emulate an IBM host to drive peripherals such as a laser printer. The device costs $1,595.

Timeplex is located at 400 Chestnut Ridge Road, Woodcliff Lake, N.J. 07675.

TALK SENSE TO THE IBM PC.

Introducing PC/204, a link that lets PC users turn mainframe data into spreadsheets effortlessly.

PC/204, the newest productivity tool from Computer Corporation of America, is a powerful, efficient, easy-to-use software link between IBM personal computers and mainframes. It effectively answers the pressing problem of how to let corporate managers take full advantage of today's personal computers for making decisions, while also giving them access to the corporate database in a format they can use.



First, PC/204 guides PC users as they browse through the MODEL 204 database. Then it extracts the data they need and converts it into meaningful management information for spreadsheet analysis. Lotus 1-2-3 for example. And PC/204 does all that automatically. Without the PC user having to understand anything about mainframe technology.

If you aren't already using Lotus 1-2-3, we can supply it along with PC/204. Or you can use any current IBM PC business package.

While PC/204 is helping business managers, it's also helping MIS directors.

PC/204 uses the power and intelligence of the personal computer for increasing the overall efficiency of an application.

For one thing, it improves performance of the mainframe by off-loading some of the processing to the PC, while reducing PC users' response time. It also makes communication between the PC and the mainframe more efficient.

What about security and control? PC/204 provides individual management views of the corporate database while still allowing PC users access to all the information they need.

PC/204 is the latest reason to get MODEL 204 DBMS which has been so highly rated for performance and programmer productivity.

For more information or to arrange for a demonstration of PC/204's capabilities, simply return the coupon or write to us on your letterhead.

Computer Corporation of America

Yes, please tell me more about: ( ) PC/204 ( ) MODEL 204 DBMS
( ) Send me a brochure.
( ) Send me info on free DBMS seminars, or call our seminar coordinator.

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Operating System: ( ) MVS ( ) DOS ( ) CMS ( ) Other: _____

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CCA's Executive DBMS Seminar Schedule

April		May		June	
Albany	Apr. 26	St. Louis	Apr. 18	Albuquerque	June 14
Anchorage	Apr. 12	Washington, D.C.	Apr. 4	Boston	June 14
Boston	Apr. 12	**May**		Buffalo	June 5
Cleveland	Apr. 19	Atlanta	May 15	Chicago	June 14
Dayton	Apr. 26	Austin	May 10	Denver	June 21
Little Rock	Apr. 5	Baltimore	May 15	Hartford	June 21
New Orleans	Apr. 5	Charlotte	May 8	Nashville	June 5
Norfolk	Apr. 10	Cincinnati	May 2	New York	June 21
Philadelphia	Apr. 3	Ft. Worth	May 3	Oklahoma City	June 7
Phoenix	Apr. 19	Harrisburg	May 2	Omaha	June 7
Princeton	Apr. 10	Milwaukee	May 3	Philadelphia	June 5
Raleigh	Apr. 10	Orange City	May 24	Pittsburgh	June 19
San Diego	Apr. 12	Pittsburgh	May 8	Rochester	June 28
		Santa Clara	May 24	Syracuse	June 27
				Washington, D.C.	June 12

NEWSWEEK from page 93

Newsweek's News Editor Stuart Seidel said the message switch will get "the right messages to the right people in the *Newsweek* organization much faster than we can do it now, with fewer errors and far less [frenzy]."

Editor-in-Chief Richard Smith, meanwhile, said the system's increased speed "means we can include more late-breaking news in each issue."

The message switch also opens the way for *Newsweek* to create a totally paperless communications path over which reports could travel from the outside bureaus to the editors in New York to the magazine's photocomposition equipment, according to Monterola.

But, he added, such sophistication is still about a year away and requires that the magazine buy at least 50% more Atex terminals and conduct further training.

"We'll never operate totally paperless," Monterola said. The Perma-Net message switch from Progressive Systems, Inc. is linked, via a Perma-Net communications line controller, to a fault-tolerant Tandem Computer, Inc. Nonstop II system, which stores the messages prior to transmission. It was the inclusion of the Tandem that was the big factor in *Newsweek*'s choice of the Perma-Net message switch, Monterola said.

Additional factors, he said, were that the vendor was local and that it was doing an installation of the same equipment at another New York magazine while under consideration for *Newsweek*'s contract.

ELITE from page 93

sures that the most urgent data is passed on first.

End-to-end error control is activated during all transmission over the virtual path, and it can be switched off, on a port-to-port basis, where it might interfere with error-control methods external to the network, the vendor claimed.

Prices for an eight-port unit start at $4,500, with deliveries 30 days after receipt of order.

Doelz Networks, 18581 Teller Ave., Irvine, Calif. 92715.

AT&T from page 93

tion Systems has not convinced him that the System 85 architecture is here to stay. He is reserving his judgment until the System 75 can be evaluated.

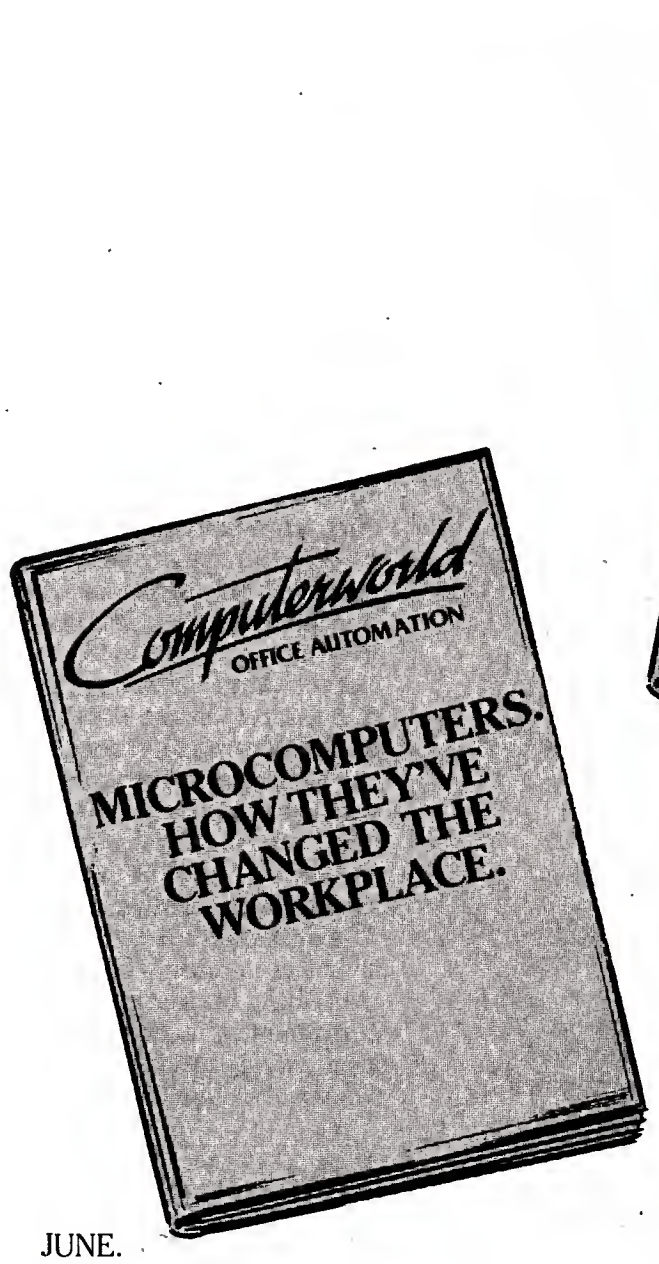
He should get his chance soon.

If that announcement date pans out, AT&T Information Systems might be able to deliver a few of the systems by year end, which may correspond with deliveries of some System 85s.

So-called "due dates" on the System 85 have been long since that switch was first introduced. Today, stated delivery on a new order for a System 85 Release 1 is 30 to 35 weeks, an AT&T spokesman said. Customers ordering Release 2 of that switch are being quoted delivery dates of Jan. 1, 1985.

The spokesman attributed the delays to market demand for the product. Due dates are expected to shorten as AT&T Technology gears up production, the results of which are expected to become evident by the third quarter of this year.

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Microcomputers.
How they've changed
the workplace.
What's new in networks, security,
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Closes May 4.



AUGUST.

Applications Software.
A look at the real issues.
Productivity. User-friendly vs.
ease-of-use. Plus plenty of
product reviews.
Closes July 6.



OCTOBER.

Workstations. We explain the
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addressing important topics like
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SYSTEMS & PERIPHERALS

Four-Phase launches 32-bit office info line

By Jeffry Beeler
CW West Coast Bureau

CUPERTINO, Calif. — Four-Phase Systems, Inc. has expanded its business focus with the introduction of a 32-bit office information computer line that reportedly combines an industry-standard microprocessor with the Unix System V operating system.

Like the existing Four-Phase product family it complements, the 6000 series is said to be targeted at the company's traditional user base — the clerical sector of the office automation field.

But unlike its sister systems, the 6000 family is also optimized for additional office personnel, including managers and secretaries, according to Four-Phase Senior Vice-President Edgar Vance.

So, with the advent of its 6000 systems line, the vendor in effect has broadened the scope of its office automation activities, Vance said.

The 6000 series announcement also coincides with a reorganization and enlargement of Four-Phase's service and support operation, which recently relocated from Silicon Valley to Dallas and acquired an additional 400 employees, he added.

Built around a 32-bit Motorola, Inc. 68010 microprocessor, the 6000 series will be sold primarily to end-user organizations. It consists of two models — the 6300 and 6600. The 6300 supports one to eight concurrent users, in contrast to the 6600, which accommodates as many as 16 terminals per application processor, according to a company source.

At present, the 6600 supports just one application processor, for a maximum capacity of 16 simultaneous users. In the future, however, Four-Phase intends to upgrade the system to accommodate up to eight such processors, Vance

See **6000** page 115

Nixdorf adds high-end unit to 8870 systems

WALTHAM, Mass. — Nixdorf Computer Corp. has announced a high-end addition to its 8870 general business systems.

Called the 8870 Model 65, the unit was designed for business applications similar to those performed by the firm's smaller 8870 processors, the 8870 Model 35 and Model 55.

The Model 65 features 512K bytes of internal memory, a hardware arithmetic unit and a 264M-byte Winchester disk drive. Disk storage can be expanded in the field to 396M bytes by adding a 132M-byte fixed disk unit, the vendor said.

Main memory can be expanded to 1M byte by adding memory expansion boards available in 256K- and 512K-byte capacities.

The Model 65 utilizes Version 5.0 of Nixdorf's Niros operating system. Niros 5.0 has a maximum file size of 66M bytes on the 8870 series, according to the company. The operating system also is said to feature a system logbook that records significant activities, such as performance statistics of the hardware and software.

The Model 65 display workstation is a microprocessor-controlled video display, which, with Niros 5.0, acts as a multiplexer for up to three slave devices, including up to two printers, that can be controlled without connection to the CPU, according to the company.

The workstation features a terminal with a 2,000-char. amber display, a low-profile keyboard and two degrees of display intensity control. The keyboard includes a standard typewriter keyboard, a 10-key adding machine keyboard and 15 programmable function keys.

The Model 65 reportedly is available with Nixdorf's Com-

See **NIXDORF** page 115

DataGeneral

Data General Corp. announced it will market an array processor developed by International Imaging Systems. The unit operates with DG's Eclipse MV line of superminicomputers/**104**

■ Royal Business Machines, Inc. announced a laser printer that can operate with a variety of popular system interfaces/**104**

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Will IBM's 4300 take over as top DDP CPU?

By Tom Henkel
CW Staff

MEDFORD, N.Y. — IBM's recently announced 4361 and 4381 processors have taken over as the premier distributed data processing (DDP) systems offered by the firm.

That is the opinion of a market research firm here, which stated the 4361 and 4381 hardware, coupled with software enhancements such as a cross-system program generator, makes the latest 4300 series processors ideal for DDP.

While other industry analysts are convinced IBM's 8100 line is still the top DDP system (see related article), Applied Management Services Corp. (AMS) said IBM has made an about-face in its 4300 systems strategy.

"Prior to [the 4361 and 4381] announcement [CW, Sept. 26], IBM had stressed mainframe processing, while portraying DDP as inefficient, uncontrollable and costly. It is apparent that IBM sees DDP as being the most important component of its future growth," the report noted.

What makes the 4361 and 4381 more efficient distributed processors?

First, the report said, technological improvements offered by the two new processors boost internal performance and offer users a more attractive price/performance ratio. For example, the older low-end 4331 processors offer internal performance of about .3 million instruction/sec (Mips). The 4361 offers internal performance of about 1 Mips. Likewise, the 4381 offers about 3 Mips compared to 1.8 Mips in the older 4341 processors.

The performance improvements were made possible by an air-cooled, very large-scale integration, bipolar chip. For example, the report said, the chips used in the 4361 are four times more powerful than those used in the earlier 4331. Further, high-speed buffers and parallel data paths also serve to boost performance.

Two operating system enhancements also make the 4361 and 4381 more attractive in a DDP environment. IBM made a statement of intent to support its Systems Network Architecture on the 4300's VM operating system. This move, the report said, is aimed at supporting interactive

See **IBM** page 115

Added features seen keeping 8100 in DDP, local net market



SHOP TALK
William Ackerman

Controversy and confusion have surrounded the IBM 8100 distributed processor since it was first delivered in 1979. To make things worse, until 1982, much of the 8100 software, particularly the DPPX operating system, was plagued with stability and performance problems. These two factors helped earn the 8100 a negative reputation, which persists today. In fact, articles about the 8100 in the U.S. and European trade press have often included predictions from industry analysts of the 8100's impending demise.

With 8100 sales figures far below projections and with considerable opposition within IBM from 4300 groups, IBM was considering discontinuation of the 8100 project in the early months of 1982. Since it had just consolidated its development efforts in the small systems area, IBM formed a task force to evaluate the possibility of reducing the burden of supporting so many small systems (Series/1, System/34, 36 and 38, 5280, 5520, 4300 and 8100).

IBM finally decided not only to keep the 8100 project alive, but also to commit additional funds to help make the 8100 a successful product. Reports indicate that IBM budgeted $100 million per year and a development staff of 600 to 700 individuals (most located in the Kingston, N.Y., area) to develop products for the 8100 line.

IBM's decision to continue funding the 8100 project was influenced by several factors:

- IBM had invested $300 million to develop the 8100.
- A significant number of IBM's largest customers had installed 8100 systems.
- Almost all of DPPX's technical problems had been eliminated.
- Orders for the 8100 systems had suddenly increased.

As would be expected with a development effort of this size, many new 8100 hardware and software products have been announced recently. These include 8130-BXX, 8150-AXX, 8150-BXX, 8102, DPCX/DOSF Release 4, DPPX/SP Release 2, Personal Computer loop adapter and so forth.

IBM's main marketing thrust for the 8100 continues to emphasize its strengths as a host-managed distributed data processing system. However, recent announcements indicate a new role for the 8100 — that of a local-area network controller for intelligent workstations

See **8100** page 112



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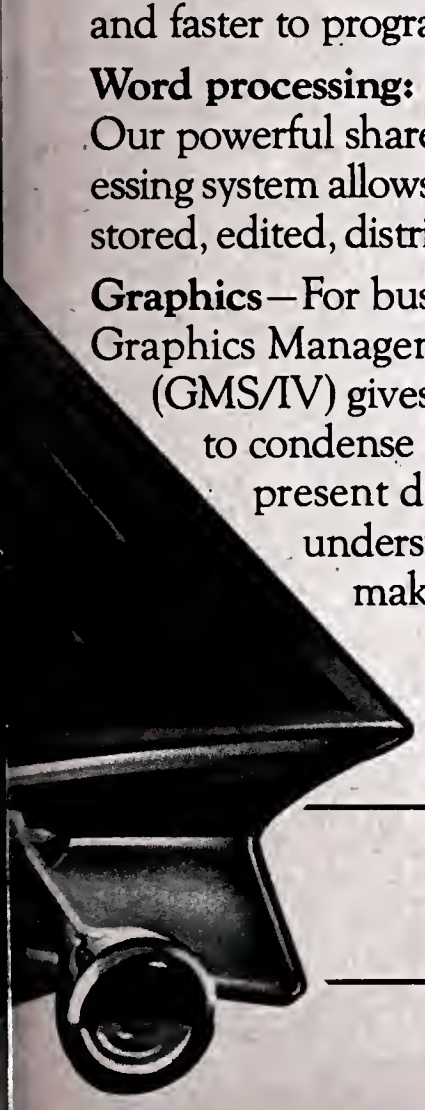
Plus, MFE dynamically allocates selected peripherals so that each device can be used by more than one program. The result—MFE eliminates the need for multiple processors, duplicate terminals and other peripheral devices at installations that require concurrent execution of software.

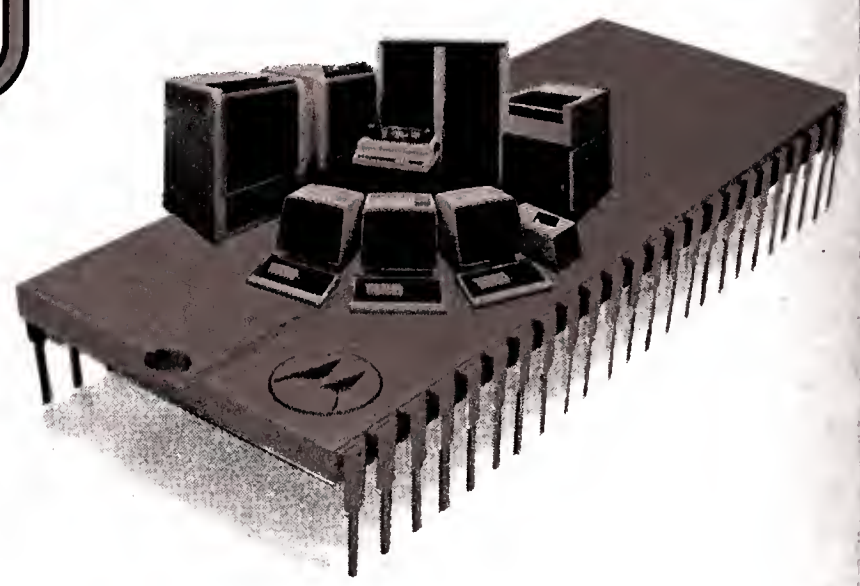
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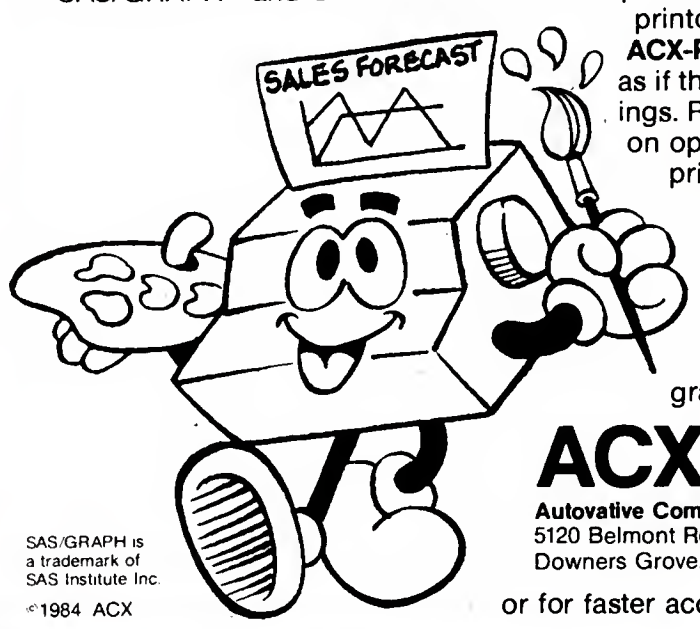
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SYSTEMS & PERIPHERALS

DG to offer array processors with Eclipse MV superminis

WESTBORO, Mass. — Data General Corp. has announced that it is marketing International Imaging Systems array processors and software with its Eclipse MV superminicomputers.

Under the marketing agreement, the Model 75 Image Processor and System 575 Image Processing Software are available on the Eclipse MV line.

The Model 75 is a general-purpose image array processor designed to implement a variety of image processing algorithms, according to the vendor.

The System 575 application software is said to include capabilities for satellite data analysis, medical image reconstruction, geologic and environmental mapping and nondestructive testing.

Model 75 is priced at approximately $50,000 and the System 575 at about $12,000, depending upon application requirements.

Additional information is available from DG's Technical Products Division, which is located at 4400 Computer Drive, Westboro, Mass. 01580.

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Laser printer out for office

WINDSOR, Conn. — Royal Business Machines, Inc. has announced an electronic laser printer said to produce up to 20 letter-size or legal-size pages per minute for office or data processing uses.

The 2800, designed for operation in an office environment, prints 23 fonts and character sizes ranging from eight to 24 points, according to the vendor. Maximum on-line font memory is eight character sets in operator-changeable cartridges, with 126 characters per set.

The printer reportedly accepts 500 sheets of 16- to 24-lb standard bond paper, as well as letterhead, colored papers and address labels. An optional 1,500-sheet cassette is available.

The 2800 is targeted toward users who want to decentralize mainframe computer printing operations by placing units directly in offices, rather than in a printer room or data processing center.

The printer provides graphics flexibility with a choice of type styles, type sizes, reverses and line spacing for creation of charts, graphs, customized business forms and logotypes, the vendor said.

It features a 240- by 240-dot matrix that gives 57,600 dot/in. The printer uses Ascii character codes and has built-in interfaces, including Centronics Data Computer Corp. and Qume Corp. Sprint 3 parallel interfaces and EIA RS-232C asynchronous and standard IBM bisynchronous 2770, 2780, 3770 and 3780.

Scheduled for delivery in the first week of July, the 2800 costs $19,500. It also is available on a rental basis.

Information is available from Royal Business Machines, located at 800 Day Hill Road, Windsor, Conn. 06095.



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In Washington State, call 206-828-8088. Ask for operator F4, who will rush you your order, send you more information, or give you the name of your nearest dealer to see Microsoft COBOL in action.

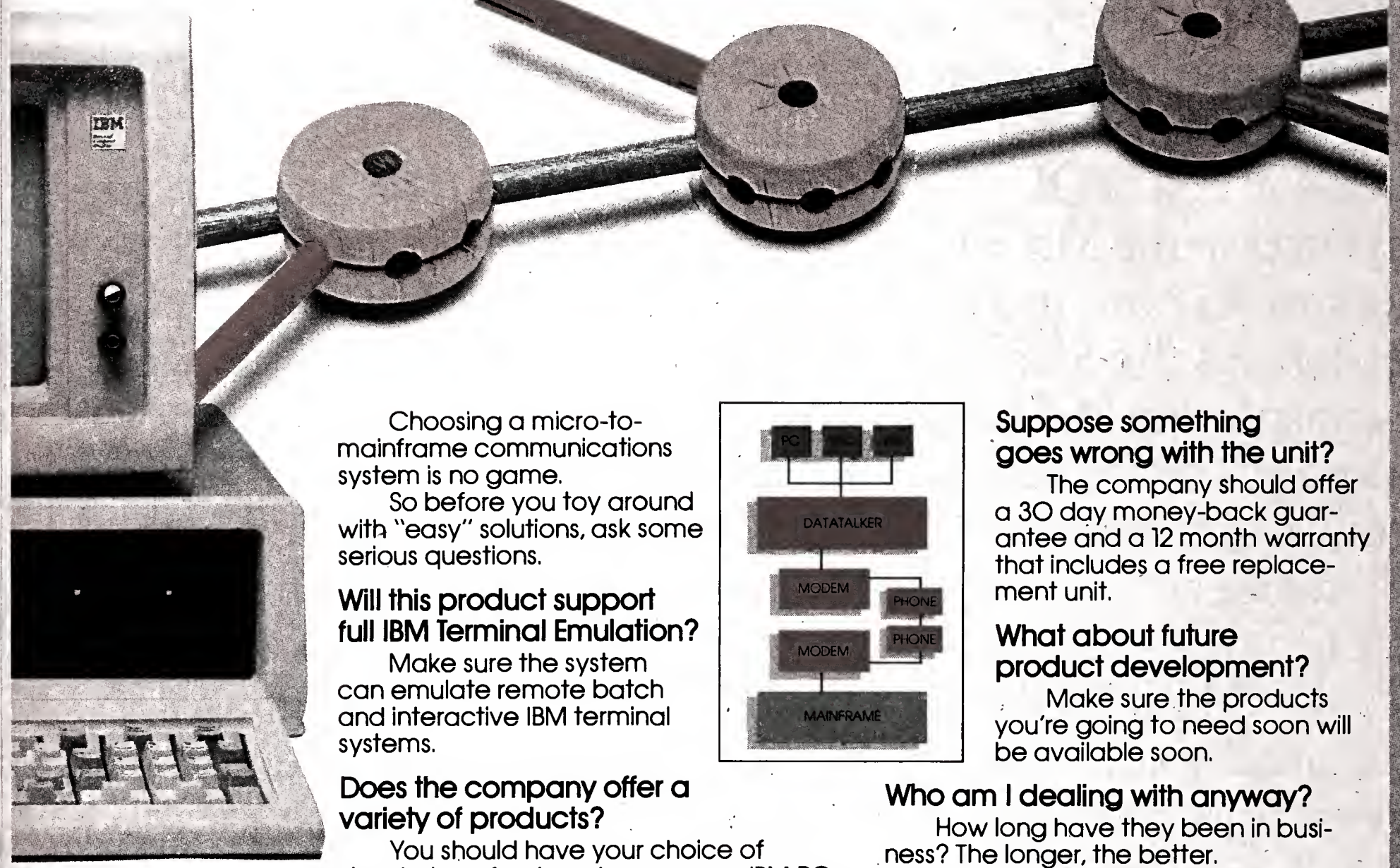


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Suppose something goes wrong with the unit?

The company should offer a 30 day money-back guarantee and a 12 month warranty that includes a free replacement unit.

What about future product development?

Make sure the products you're going to need soon will be available soon.

Does the company offer a variety of products?

You should have your choice of stand-alone front-end processors, IBM PC or XT boards, or an OEM board. All ready to run on the most popular operating systems.

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SYSTEMS & PERIPHERALS

TERMINALS

MYSTIC VALLEY ENGINEERING, INC.
Annunciator Terminal

Mystic Valley Engineering, Inc. has announced a graphics terminal designed to allow industrial users to draw characters up to three inches high using a single Ascii code.

The Annunciator Terminal can be used on a stand-alone basis or, if major plotting is desired, with Mystic Valley's Ugraph format development software on the Digital Equipment Corp. PDP-11 minicomputer under DEC's RT-11 operating system. It uses a standard RS-232 channel, the vendor said.

The terminal is said to construct messages in a combination of eight colors, with letters up to three inches high and a blinking feature. It reportedly stores up to 96 full screen formats in permanent memory.

According to the company, Ugraph allows formats to be designed using a stored library of standard objects, as well as special, user-defined library objects. The terminal format is said to be nonvolatile and capable of being modified on-line.

A message terminal-level configuration is priced at $4,395, a low-resolution graphics system at $4,700 and a high-resolution graphics system at $6,200. Ugraph is priced at $2,995 for object code.

Mystic Valley Engineering, Suite 3600, 400 W. Cummings Park, Woburn, Mass. 01801.

I-O MARKETING
I-O 1191

I-O Marketing has announced a twin-axial, plug-compatible display station designed as an alternative to the IBM 5251/11 and 5291 workstations with the IBM System/34, 36 and 38 processors.

The I-O 1191 reportedly features an IBM 5251/11 character set, autoscreen dimming, high-resolution screen with interlaced refresh and screen dump to the RS-232C serial printer port. It is said to come with built-in help screens and diagnostics. Its 14-in. nonglare screen is designed to tilt 28 degrees and swivel 360 degrees.

A printer port option permits interface with any RS-232 asynchronous Ascii serial interface printer. The port reportedly can be configured to emulate an IBM 5224, 5225 or 5256 printer.

The display station is priced at $1,595, and the printer port at $395, the vendor said.

I-O Marketing, 3647 W. 1987 S., Salt Lake City, Utah 84104.

AMPEX CORP.
Ampex D175 DP; D175 PR

Ampex Corp. has announced special emulations for Datapoint Corp. and Prime Computer, Inc. video display terminals.

The Ampex D175 DP terminal reportedly performs most of the functions of the Datapoint Model 3601 and 8200 Rev 1 terminals, while making available to the user additional features that are standard in the Ampex D175.

The Ampex D175 PR is said to provide an alternative to the Prime Model PST100 terminal. Both systems are available from Ampex distributors, who also offer a software installer that automatically changes terminal tables in the Prime operating system.

The Ampex D175 DP and D175 PR each cost $995.

Ampex, 401 Broadway, Redwood City, Calif. 94063.

TELETYPE CORP.
Model 5410

Teletype Corp. has introduced the Model 5410 asynchronous terminal, a telecommunications terminal with an optional modem/dialer.

According to the vendor, the modem/dialer operates at either 300 or 1,200 bit/sec and is compatible with the Bell 212A modem. It provides intelligent functionality through autodial and automatic logon features. Users can preset three autodial keys, each of which can access its own CPU or time-sharing service.

It features an 80- or 132-col. display screen, with display in either white, green or amber. The entire screen can be put into reverse video mode, and a screen saver feature blanks out the screen if no keys are depressed within

Continued on page 108



RDH-100S **ADC's standard-setting disk handling peripheral that allows any computer to mass-produce diskette copies!**

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Multiple Format Users: ADC offers you both low-volume and high-volume "Floppie Coppier" systems to choose from—the IC-455 controls simultaneous dual sided copying of 8", 5¼" and 3½" diskettes. ADC's IC-475 loads all your floppy data into a built-in winchester which can then direct the RDH-100S to produce the desired number of copies for each successive floppy. And for high-volume production, ADC's new Series 4000 can control up to 16 simultaneous diskette handlers—each with its own built-in RDH—and you can copy both sides of double-sided diskettes at once!

Whatever your "Floppie Coppier" needs, ADC has the system to suit you—and you're assured of high-speed efficient duplication with the Robotic Disk Handler!

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SYSTEMS & PERIPHERALS

Continued from page 107
an hour's time.

The terminal sells for $915, the vendor said.

Teletype, 5555 Touhy Ave., Skokie, Ill. 60077.

LIBERTY ELECTRONICS CO.
Freedom 110

Liberty Electronics Co. has announced a low-end, smart video display terminal, the Freedom 110.

The Freedom 110 features tilt-and-swivel styling; a detached, 94-key, European DIN-standard keyboard with numeric key pad; and a nonglare, green-phosphor display.

Standard features include a 24-row by 80-col. display with user-accessible 25th status line, 10 programmable, nonvolatile function keys and flexible full-page or status-line setup modes.

The Freedom 110 sells for $595, with quantity discounts available.

Liberty Electronics, 625 Third St., San Francisco, Calif. 94107.

FALCO DATA PRODUCTS, INC.
Fame-2 enhancements

Falco Data Products, Inc. has announced an enhanced version of its Fame-2 CRT terminal.

The terminal is said to include as standard features a 14-in. green-phosphor screen and 132 col. of data. Those features had previously been options. Options now include an amber screen.

The terminal continues to feature 20 user-programmable function keys, and it has room in nonvolatile memory for up to 1,000 char. It also features transparent print mode, split screen, underline, reverse video, blinking and blanking.

The enhanced terminal is scheduled for April shipment.

It is priced at $795.

Falco Data Products, 1286 Lawrence Station Road, Sunnyvale, Calif. 94089.

COMPUTER DESIGN & APPLICATIONS, INC.
Deltapro

Computer Design & Applications, Inc. (CDA) has announced a tabletop workstation for processing and viewing image data in medical, scientific and engineering applications.

Deltapro is said to provide retrieval, manipulation and evaluation of image data in the fields of nuclear magnetic resonance, ultrasound, planetary geology, commercial printing, earth satellite resources and geophysical exploration.

It was designed to be attached to Maxdelta, CDA's imaging system, which uses a Digital Equipment Corp. VAX-11 superminicomputer.

Deltapro is said to use a CDA MSP-3000 array processor with the VAX-11 and a color raster display system.

According to the company, the array processor's architecture allows it to perform specialized matrix-oriented arithmetic operations. It is said to transfer image data only once over the DEC Unibus, which gives Deltapro processing access to data from the centralized data base.

The 2M-byte, local-display refresh memory is expandable to 8M bytes to store, process and display images of frame sizes from 32^2 to 512^2.

The terminal is said to display images, curves, text and overlay information in 4,096 colors and 256 gray levels on a 13-in. monitor with a display resolution of 512 by 480 pixels.

Deltapro uses CDA's imaging command language Medicl.

Now available, Deltapro is priced at $47,000 for the 2M-byte version and $75,000 for the 8M-byte version.

CDA, 411 Waverly Oaks Road, Waltham, Mass. 02154.

MASSCOMP
Workstation 500 addition

Masscomp has announced the addition of a dual-terminal, single-processor workstation to its Workstation 500 family of Unix-based products.

The dual system includes two independently functioning color or monochrome raster displays running on a single 32-bit CPU. According to the company, each display has a dedicated microprocessor that generates its own graphics images while freeing the CPU to run computer-aided design, engineering, scientific and technical applications programs.

It is said to enhance applications such as solids modeling, very large-scale integration design, simulation and numerical analysis.

The company claims that the dual-display configuration reduces the per-display price by up to 40% in comparison to the single-user Workstation 500.

The Workstation 500 products are said to be compatible with the company's MC-500, a 32-bit, Unix-based superminicomputer.

The dual-user workstation supports two Masscomp 19-in. raster graphics displays in monochrome or color. Each display has a dedicated graphics processor with a 128K-byte program store and can be located up to 150 feet from the host.

The system uses Masscomp's RTU, a real-time, virtual memory Unix operating system.

A typical dual-user Workstation 500 system with CPU, 1M byte of error-correcting memory, the Unix operating system with C and Fortran compilers and a dual, 19-in., 1,024-by 1,024-pixel monochrome graphics display costs $11,370 per workstation display in quantities of 100. A similar system with twin 19-in., 832-by 600-pixel color displays costs $15,270 per display in quantities of 100.

Masscomp, One Technology Park, Westford, Mass. 01886.

See **TERMINAL** page 109

SYSTEMS & PERIPHERALS

TERMINAL from page 108

SYNTREX, INC.
Pisces

Syntrex, Inc. has announced an office workstation designed to allow concurrent tasking using multiple windows.

Called Pisces, the unit is said to allow the user to communicate with a mainframe through one window while editing or doing document merge or other tasks in another window. The workstation can communicate with the IBM 370 and 4300, Hewlett-Packard Co. and Digital Equipment Corp. mainframes.

Pisces consists of a screen and keyboard with the Intel Corp. 186 processor and 384K-byte internal memory. The standard storage module is a 10M-byte mini-Winchester.

It is priced at $7,590 with a removable keyboard and $9,190 with an electronic typewriter. Delivery is scheduled for April.

Syntrex, 246 Industrial Way W., Eatontown, N.J. 07724.

GRAPHICS SYSTEMS

RAMTEK CORP.
9460; 9465 display systems

Ramtek Corp. has introduced medium-resolution versions of its 9460 and 9465 graphics and imaging display system.

According to the vendor, the products are for users who want high-performance graphics processing, but don't require high resolution — specifically, for markets where an image background is displayed with a graphics overlay.

The 9460 and 9465 medium- and high-resolution systems are compatible with each other, as well as with Ramtek's earlier 9400 and 9450 display systems, the company said.

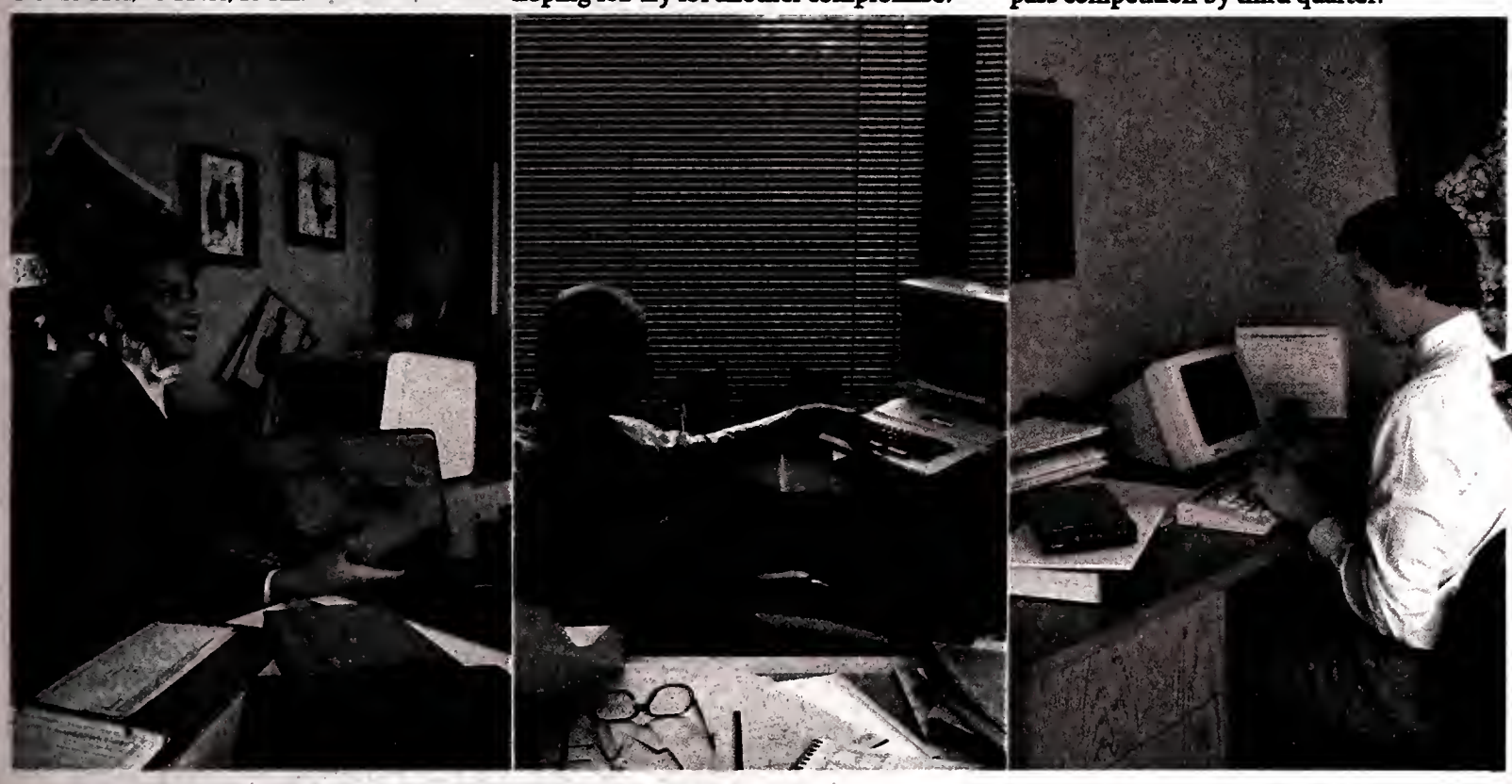
The 9460 and 9465 are configured with either the Motorola, Inc. MC68000- or Zilog, Inc. Z80-based controllers. The MC68000 models include 240K bytes of random-access memory (RAM), while the Z80 systems have 12K bytes of user RAM,

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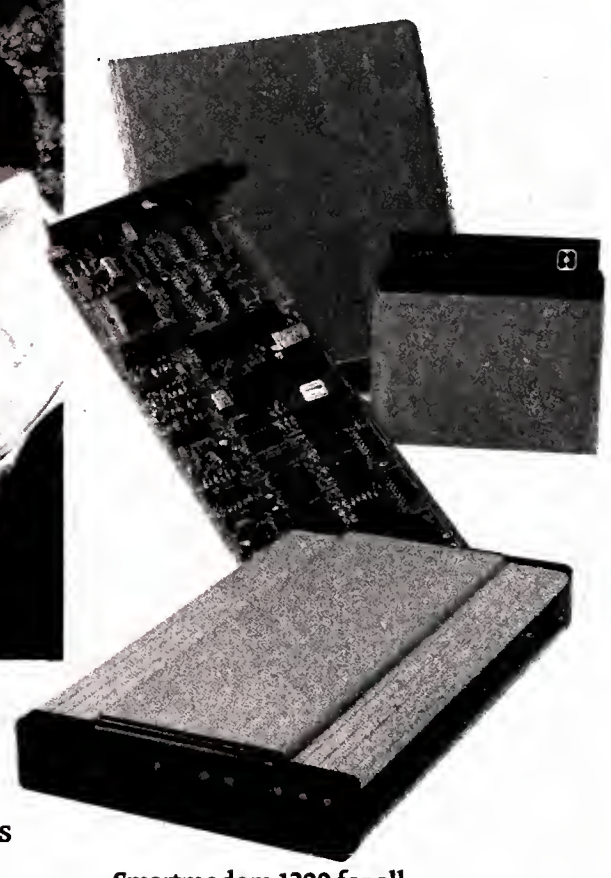
To all reps: Price changes on following items effective immediately: No. 10-11A, 10-114A, 10-AL.

Chris: The latest offer looks better, although it's still not what we were hoping for. Try for another compromise.

Just got the word from Gary. Increased our share by 6%. If trend holds, we'll pass competition by third quarter!



Smartcom II communications software, currently available for IBM PC, DEC Rainbow 100, Xerox 820-II and Kaypro II.



Smartmodem 1200 for all computers with an RS-232C interface; Smartmodem 1200B plug-in board for the IBM PC.

Microcomputer communications? Get control of the situation with Hayes™

Microcomputer communications can present the DP/MIS staff with a tangle of mis-matched hardware, user-hostile software, and a situation that can quickly get out of hand.

Hayes can help you avert that chaos, with a telecomputing system designed expressly for microcomputers.

A system so advanced, it's downright simple. Economical. And requires no handholding from you.

Hayes. The computer's telephone. Our Smartmodem 300™ and Smartmodem 1200™ connect to any desktop computer with an RS-232C port. They operate with rotary dial, Touch-Tone® and key-set telephone systems. At full or half duplex. And both feature self-test capabilities, as well as indicator lights and built-in speakers for monitoring calls.

The lower-priced Smartmodem 300 is ideal for local data swaps and communicates at 300 bps. A built-in speed selector on Smartmodem 1200 automatically detects transmission speeds (110, 300 or 1200 bps).

Smartmodem 1200B™ is also available as a plug-in board for IBM® Personal Computers. And Hayes manufactures the Micromodem IIe® for Apple® II, III, IIe and Apple Plus computers, as well. It comes packaged with Smartcom I™ communications software.

Speaking of software, more programs are written for Hayes modems than for any other. And that impressive list includes our own incomparable communications software.

Smartcom II.™ Complete, menu-driven software for the IBM PC, DEC Rainbow 100,™ Xerox 820-II™ and Kaypro II.™ Even first-time communicators will find success with Smartcom II. Screen prompts guide users in the simple steps it takes to create, send, receive, list, edit, name and re-name files.

Tasks like simultaneously receiving, printing and storing data–completely unattended–are easily managed with Smartcom II, because it takes full advantage of Smartmodem's capabilities.

The program reduces lengthy dial-up and log-on sequences to a single keystroke. It stores communications parameters for 25 remote systems.

Plus, there's an on-line help feature that explains prompts, messages and parameters.

Our reputation speaks for itself. Hayes has five years of solid leadership in the microcomputer industry. Nationwide availability through retail computer stores. Trouble-free factory service and call-in assistance. A limited two-year warranty on all hardware. And the most efficient telecomputing system available. Anywhere.

If you're involved in linking micros or setting standards for configurations, remember this. Everything your people need to know about communications can be summed up in one word: Hayes.

Hayes®

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Smartmodem 300, Smartmodem 1200, Smartmodem 1200B, Smartcom I and Smartcom II are trademarks of Hayes Microcomputer Products, Inc.
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IBM is a registered trademark of International Business Machines Corp.
Apple is a registered trademark of Apple Computer, Inc.
DEC Rainbow 100 is a trademark of Digital Equipment Corporation.
Xerox 820-II is a trademark of Xerox Corporation.
Kaypro II is a trademark of Non-Linear Systems.
Z8 is a trademark of Zilog, Inc.
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Smartmodem Specifications:
Low Speed Data Format: (Smartmodem 1200 and Smartmodem 300) Serial, binary, asynchronous: 7 or 8 data bits; 1 or 2 stop bits; odd, even or no parity (0-300 bps).
High Speed Data Format: (Smartmodem 1200) Serial, binary, asynchronous: 7 data bits; 1 or 2 stop bits; odd, even, or fixed parity or 8 data bits; 1 or 2 stop bits; no parity (1200 bps).
Dialing Capability: Touch-Tone® and rotary-dial pulse dialing.
Command Buffer: 40 characters.
Commands: (unnecessary with Smartcom II software) A: Immediate answer. A/: Repeat last command. C: Transmitter Carrier. D: Dial command, including simple dialing, waiting for second dial tone, auto-dialing and other features. E: Local echo. F: Full/half duplex. H: Switch hook. M: Audio monitor. O: On-Line. P: Pulse dialing. Q: Quiet mode. R: Reverse originate/answer mode. S: 17 "Set" commands speed, escape code character, number of rings to answer on, etc. S?: Checks operational parameters above. T: Touch-Tone dialing. V: Verbal result codes.
Result Codes: (can be numerical/verbal): 0/OK: Command line ok. 1/Connect: Carrier detected. 2/Ring: Phone is ringing. 3/No Carrier: Carrier lost or never heard. 4/Error: Error in command line. 5/Connect 1200: Carrier detected at 1200 bps. (Smartmodem 1200 only.)
Audio Monitor: Two-inch speaker with volume control.
Rear Panel: On-off switch, power jack, RS-232C connector, modular phone jack connector, volume control.
Operation: Full or half duplex.
Data Rate: 0-300 bps and 1200 bps for Smartmodem 1200; 0-300 bps for Smartmodem 300.
Interface: RS-232C.
Intelligence: Z8™ microprocessor with 4K byte control program for Smartmodem 1200; Z8 microprocessor with 2K byte control program for Smartmodem 300.
Modem Capability: Bell System 103 or 212A compatible originate or answer mode for Smartmodem 1200; Bell System 103 compatible originate or answer mode for Smartmodem 300.
Receive Sensitivity: -50dBm for Smartmodem 1200; -45dBm for Smartmodem 300.
Transmit Level: -10dBm.
Registration: FCC registered for direct-connect to the nationwide phone system. Connects with modular jacks RJ11W, RJ11C, RJ12W, RJ12C, RJ13W, RJ13C.
Power Pack: U.L. listed 120VAC, 60Hz, 13.5VAC output.
Size: 1.5" × 5.5" × 9.6"

SYSTEMS & PERIPHERALS

Continued from page 109

optionally expandable to 256K bytes.

Configuration options include 1,280- by 1,024-pixel or 640- by 512-pixel resolution.

Prices for the 9465 start at $10,450 for medium resolution and at $11,250 for high resolution. For the 9460, prices start at $19,300 (medium) and $20,100 (high).

Ramtek, 2211 Lawson Lane, Santa Clara, Calif. 95050.

RASTER TECHNOLOGIES, INC.
Model One/80 enhancement

Raster Technologies, Inc. has announced an enhancement that is designed to allow its Model One/80 graphics system to switch from 60-Hz noninterlaced refresh rates to 30-Hz interlaced refresh rates.

The Model One/80 was designed for mechanical and electric computer-aided design, simulation, modeling and geophysical applications.

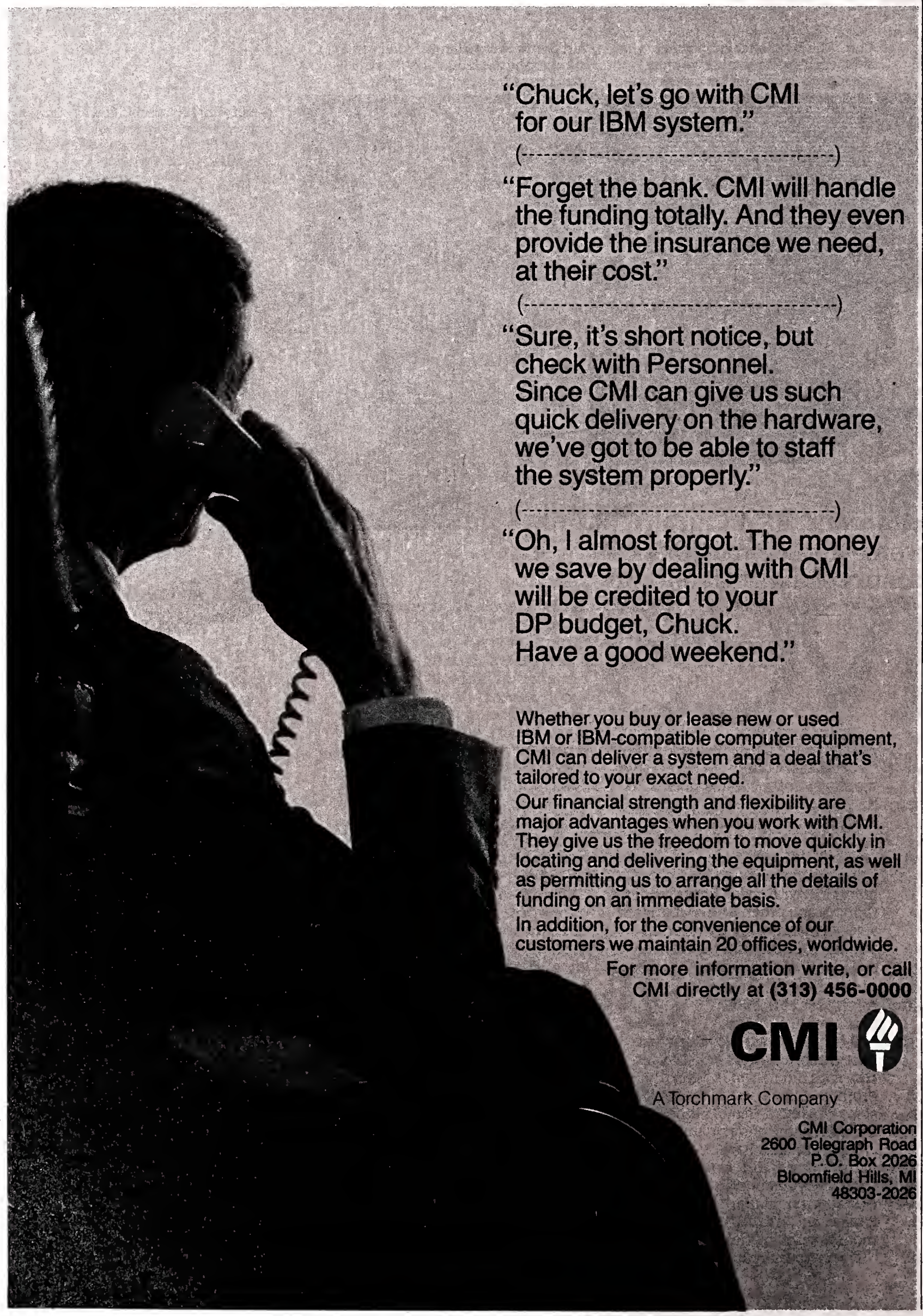
The enhancement allows designers and other users to perform prototype development work on a less expensive 30-Hz interlaced monitor, while actual production units can use the high-performance 60-Hz noninterlaced refresh rates, the vendor said.

According to a spokesman for the vendor, the feature will allow the use of 30-Hz color hard-copy devices in a system with a 60-Hz. noninterlaced monitor.

The enhanced version of the Model One/80 system is scheduled for delivery this month.

The enhancements will not affect the price, which starts at $20,000, the spokesman said.

Raster Technologies, 9 Executive Park Drive, North Billerica, Mass. 01862.



POWER SUPPLIES

DATA TRANSLATION, INC.
DT6700 modules

Data Translation, Inc. has announced five plug-in input modules as part of its DT6700 family of solid-state, isolated signal conditioning products.

The modules are said to provide input protection, isolation, amplification and filtering of sensor signals while producing analog outputs compatible with most industrial process instrumentation, including 12-bit data acquisition systems.

The recently announced products are the Model DT6703 isolated resistance temperature detector (RTD) analog input module, designed to accommodate a two- or three-wire 100-ohm RTD device; the Model DT6704 isolated bridge completion analog input module, designed to accommodate a two- or three-wire resistive transducer; the Model DT6711 isolated analog signal conditioning input module; the Model DT6712 isolated analog signal conditioning input module; and the DT6718 1-kHz isolated tachometer frequency-to-voltage input module.

Prices are $250 each for the DT6703, DT6704 and DT6718; $235 for the DT6711; and $240 for the DT6712.

Data Translation, 100 Locke Drive, Marlboro, Mass. 01752.

BOARD-LEVEL DEVICES

EVENTIDE, INC.
WKBP-16 board

Eventide, Inc. has announced a 1M-byte memory board with 256K-bit chips for the Hewlett-Packard Co. Series 200 desktop computers.

The WKBP-16 board is designed to provide four times the memory density of previously available boards, according to Eventide.

The board is intended for use with the HP 9816, 9826 and 9836 computers, providing extra memory without expansion interfaces.

The board is available, priced at $4,200. Quantity discounts are available.

Eventide, One Alsan Way, Little Ferry, N.J. 07643.

AVIV CORP.
Aviv Models 505A and 505B

Aviv Corp. has announced two tape controllers for Intel Corp. Multibus-compatible computers.

The Aviv Model TFC 505A and 505B are ½-in. tape controllers for start/stop drives

Continued on page 112

"The office automation I bought for everyone in the corporation doesn't incorporate everyone."



Exxon stops the shock...with fully integrated office automation for everyone in the corporation.

Introducing the Exxon Business Support System.

An office automation system that can't support everyone in your corporation can lead to some very shocking experiences.

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That's why Exxon Office Systems now offers more practical office automation solutions that help everyone in the corporation to be more productive. With the Business Support System, Exxon extends its fully integrated line of office automation products to support managers, professionals, and administrators, as well as secretarial staff.

Exxon puts it together for everyone with a fully integrated system — with full communications flexibility that lets you access outside data bases and interact with most mainframe computers. Without the complications. Without the shock.

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The Exxon Business Support System features the new EXXON 750 Professional Workstation, specifically designed with powerful, integrated software that lets you move instantly from text to graphics to data processing — without changing programs.

You can divide the high resolution bit-map display into several windows and work in a number of functions simultaneously. You can shift information from one window to another. You can preview the page layout, and produce an integrated text/graphics document on our quiet EXXON 965 Ink Jet Printer. Or on a color plotter.



The EXXON 750 Professional Workstation gives you the power to use data, graphs and text in any combination.

Best of all, the flexible design of our new Professional Workstation is ready for adaptation to the most popular operating systems and network interfaces.

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At the core of the Business Support System is the EXXON 8400 Series controller. With its UNIX*-based operating system, it can integrate all levels of workstations to share information and programs. Everyone can keep track of schedules and meetings with time management and calendaring functions, whether their workstation is an EXXON 500 Series Information Processor or a new EXXON 750 Professional Workstation. And everyone can send and receive messages easily with transparent electronic mail.

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Exxon protects your office automation investment by making every workstation — from the EXXON 500 Series to the new EXXON 750 Professional Workstation — fully expandable and upgradeable.

So if you've already begun an Exxon system, the latest Exxon advances are completely compatible with our current product line.

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EXXON OFFICE SYSTEMS

The future...without the shock.

SYSTEMS & PERIPHERALS

Continued from page 110

with group-coded recording of 6,250 bit/in. The TFC 505A was designed to operate with the Storage Technology Corp. 125 in./sec Model 1953/35 drive and the TFC 505B to operate with the STC 50 in./sec Model 2920 drive.

Both controllers reportedly are built on a single board and comply to the IEEE-796 Multibus standard.

The controllers are said to be compatible with the Aviv multiport system, a feature designed to allow up to six central processors to share tape drives.

Available 30 days after receipt of order, the controllers are priced starting at $2,950, according to the vendor.

Aviv, 26 Cummings Park, Woburn, Mass. 01801.

AUXILIARY EQUIPMENT

INTERNATIONAL INFORMATION MANAGEMENT CONGRESS
Record Management Technology

The International Information Management Congress (IMC) has announced a training program designed to instruct employees in storing and retrieving manual files and computer memory.

The program, Record Management Technology, includes 297 color slides and a 52-page book, the vendor said.

Topics include records storage and retrieval, reprographics, micrographics and records management trends.

The training program costs $350.

IMC, Publication Sales, P.O. Box 34404, Bethesda, Md. 20817.

TEXAS INSTRUMENTS, INC.
Nubus

Texas Instruments, Inc. has announced that it is licensing its 32-bit Nubus technology to commercial and noncommercial users.

Designed at MIT, Nubus is a 10-MHz synchronous bus that reportedly provides a 37.5M byte/sec bandwidth and a processor-independent, memory-mapped architecture.

Nubus licenses to commercial users for a one-time $2,000 fee. Noncommercial licenses are available for $200.

Texas Instruments, Data Systems Group, 17881 Cartwright Road, Irvine, Calif. 92714.

SIX IBMs ALL IN ONE CIE

It's like getting five IBM terminals free.

In a CIE-7800, you get plug compatibility with the IBM 3178 and all five models of the 3278 series. Yet, a multi-model CIE-7800 costs less than any single one of those IBM terminals.

Both smaller and bigger at the same time

What meets the desktop is a far more compact terminal, too. The CIE-7800 is 40% smaller than any IBM.

But, through the ingenuity of CIE/ACM design, what meets the eye is a screen over one-third larger than IBM's.

The CIE monitor also rotates and has an upward tilt of from 0 to 20 degrees for adjustable viewing. And it weighs less than 20 pounds, so it's easily moved. It's user-friendly to the *nth* degree.

22 keyboards

The detached, low profile keyboard has an 87-key IBM compatible layout. And it can be user-configured into any of nearly two dozen U.S. and international keyboards, all of which give you a continuous adjustment angle of from six to 11 degrees.

Alternate DEC® and HP 2622 personalities

The CIE-7800 is available with *concurrent* alternate personalities. With a single command, you can switch to DEC VT100,® or HP 2622, or IBM 3101-3104, or IBM 3275/3276-2 (bisynch single station), while still retaining IBM 3178/3278 compatibility. No other terminal is as versatile. Not one.

New CIE-7850 "add-in" intelligence

The new CIE-7850 is more than just an add-on. It's an add-in. As shown below on our screen, you simply plug the 7850 into the Coax-A line between the controller and terminal to give you access to both on-line mainframe processing power and local intelligence.

The CIE-7850 conducts concurrent operations in either 3178/3278 or its local intelligence mode, which is *100% IBM PC compatible.*

To learn more, just contact ACM, Inc., Suite 540, 3857 Birch Street, Newport Beach, Ca. 92660. Or call toll free. 1-800-854-5959. In California, call 1-800-432-3687.

CITOH ELECTRONICS ACM



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8100 from page 101

such as IBM Personal Computers. The 8100's local-area network is a twisted-pair Synchronous Data Link Control (SDLC) loop that utilizes a token passing technique similar to the IEEE 802 standard. There are approximately 30,000 8100 local-area nets installed throughout the world.

Among the capabilities that IBM is emphasizing for the 8100 as a local-area network controller are:

■ Connectivity: Most SDLC, bisynchronous and asynchronous devices can be connected to the 8100. Of particular interest is the new interface for attaching the IBM Personal Computer to the 8100's local-area network. Personal Computers attached to the 8100 can access 8100 applications as well as host applications. 8100s can also be peer-connected to other 8100s.

■ Shared disk storage: Intelligent workstations attached to the IBM 8100 can utilize the 8100's disk drive for backup and sharing data. Bidirectional file transfer is supported for IBM Personal Computers and Displaywriters. With the announcement of the IBM 8102 I/O unit, over 1G byte of disk storage is available.

■ Print management: Intelligent workstations attached to an 8100 system can direct workstation data to 8100 printers. The 8100 operating system provides tools for managing multiple printers and print queues. This eliminates the need for each workstation to have its own printer, which reduces the cost of each workstation and allows higher quality and more reliable 8100 printers to be used.

■ Continuous operation: The recently announced 8150-B processor consists of multiple CPUs, data channels and memory banks that allow the 8100 to continue operating (in a degraded mode) in the event of a failure. In addition, the DPPX operating system can automatically maintain multiple copies of a disk volume so that the system can continue to operate if a drive crashes.

■ Programmability: Among the high-level languages supported by the 8100 are: Cobol, PL/I, Fortran and APL. Applications written using IBM's cross-systems product can execute on the 8100 as well as on a host system under CICS, SSX, TSO or CMS. An 8100 data base manager is also available.

■ Processor range: IBM offers 21 different models of 8100 processors, ranging in power from about .2 million instruction/sec (Mips) to over 1.3 Mips and providing support for clusters of a few up to a few hundred workstations.

■ Centralized control: The attachment of any kind of intelligent workstation to any kind of network can be viewed as distributed data processing (DDP). One important factor in the success of a DDP network is central control. The same capabilities that are utilized to manage 8100 networks from a central site can also be used to manage 8100-attached workstations.

■ Systems Network Architecture (SNA) integration: SNA is used in the connection of workstations to the 8100 and in the connection of 8100s to other 8100s and host computers. The 8100 can be viewed as an integration of local-area and wide-area networks into the SNA environment.

IBM clearly intends to exploit

See **8100** page 115

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UP TO 16 USERS AND 16-BITS.
Up to 16 workstations can be used with the TS 816, creating a flexible multi-tasking system. Any combination of 8 and 16-bit personal computers can be supported, with or without local storage.

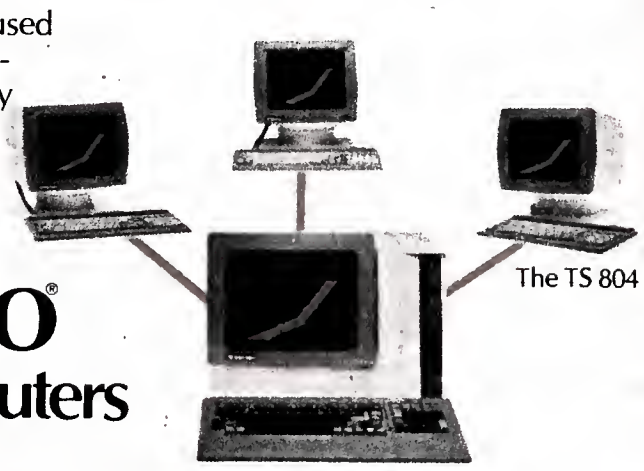
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The TS 816: Up to 16 users



The TS 804

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Name_____ Title_____

Company_____

Address_____

City_____ State_____ Zip_____

DATAPOINT

We sparked the revolution.

SYSTEMS & PERIPHERALS

NIXDORF from page 101

et application software package, which features financial accounting, order processing, inventory control, production control, fixed assets, purchase orders, cost accounting, word processing and a report generator.

Peripherals and software are said to be compatible with other systems in the 8870 family.

The price for a Model 65 with 512K bytes of memory, hardware arithmetic unit, 264M-byte hard disk storage, a 300 line/min printer and four terminals is $92,700, according to the vendor.

It is available for delivery 90 days after order.

More information is available from Nixdorf, which is located at 300 Third Ave., Waltham, Mass. 02154.

8100 from page 112

these strengths to extend the 8100 into the local-area network market. The 8100 may meet its stiffest competition from other IBM products that support the IBM Personal Computer. IBM is expected to continue developing the 8100 as a host for intelligent workstations in SNA networks controlled from a central site.

IBM's efforts to turn the 8100 around may be paying off. It is estimated that IBM has now sold over $1 billion of 8100 hardware and software. Postnatal complications are not unusual — the infancy of the 8100 has been no exception.

Ackerman, a longtime 8100 supporter, is president of DPX, Inc., a Cupertino, Calif., consulting firm specializing in the 8100.

IBM from page 101

computing on the 4300. In addition, IBM announced that its latest top-of-the-line operating system, MVS/XA, will be supported on the 4381.

This, the report said, offers 4300 users functions heretofore only available in the larger 3080 series of processors. In addition, users of the 4361 processor can now directly attach IBM Displaywriters and Personal Computers to their systems, the report noted.

One of the most significant boosts IBM gave the 4361 and 4381 for DDP applications was the availability of cross-system program generators, which enable a programmer to write applications for IBM 8100, 4300 and 3080 series processors simultaneously.

The report noted that IBM's cross-system products make it easier to transfer applications between the 8100's DPPX/SP operating system, MVS/TSO and the VM operating systems. The report speculated that IBM will soon announce a product that will provide a similar capability between the 4300 and the System/38 processor.

Lastly, the report noted that a series of migration aids allowing users of the smaller System/34 processors to switch applications to 4300 processors using the SSX/VXE operating system may be further indication of IBM's intent to develop the 4300 line into the premiere DDP system.

The report, called "IBM 4361/4381 Processors In-Depth Report," costs $85 from AMS through Box 350, Medford, N.Y. 11763.

6000 from page 101

said.

Both members of the 6000 family are aimed mainly at Fortune 1,000 companies and fall into basically the same performance class as the IBM 8100, System/36 and System/38, according to Four-Phase Senior Vice-President Tony Yates.

The two office automation models are also said to be software-compatible down to the object-code level.

Because they run under a Unix-derived operating system that supports demand-paged virtual memory, the 6000 series systems already boast a large library of prewritten application packages, according to Four-Phase Product Marketing Director Roger Breding.

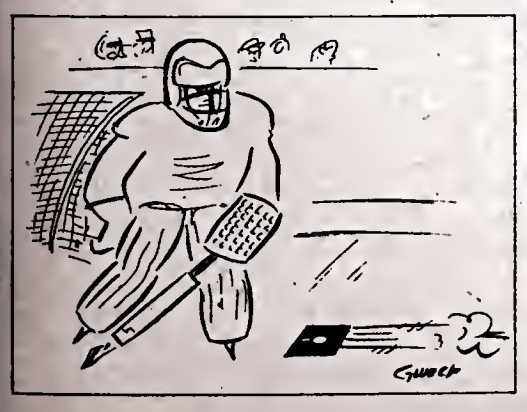
Buffering the two systems' users from their control program is Four-Phase's proprietary Unix shell known as Uniview, which reportedly permits up to eight screen windows to be displayed simultaneously. Information can be electronically exchanged between any of the eight windows, a company source said.

The 6300 and 6600 also support an assortment of programming languages including Cobol, Basic, Pascal, C and Sibol, the latter of which makes the 6000 series machines compatible with applications written under Digital Equipment Corp.'s Dibol.

In addition, the two models reportedly accommodate Oracle Corp.'s Oracle data base management system and various communications protocols like 2780/3780 bisynchronous, 3770 remote job entry and 3270 Systems Network Architecture.

A 6300 system configured with two workstations, a 20M-byte disk module, a 1M-byte main memory and a character printer costs $15,181. A 6600 configuration, with a 1.5M-byte memory, 74M bytes of disk storage and eight workstations sells for $70,650.

Shipments of both systems begin immediately from Four-Phase at 10700 N. De Anza Blvd., Cupertino, Calif. 95014.



"dBASE II® helps keep us on our toes."

Robert Hubert
Marketing Director
The Boston Ballet



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"Recently, we hired a custom systems house to develop a long-range computer program for The Boston Ballet. Without prejudice, they came back and said the new system should be based on dBASE II."

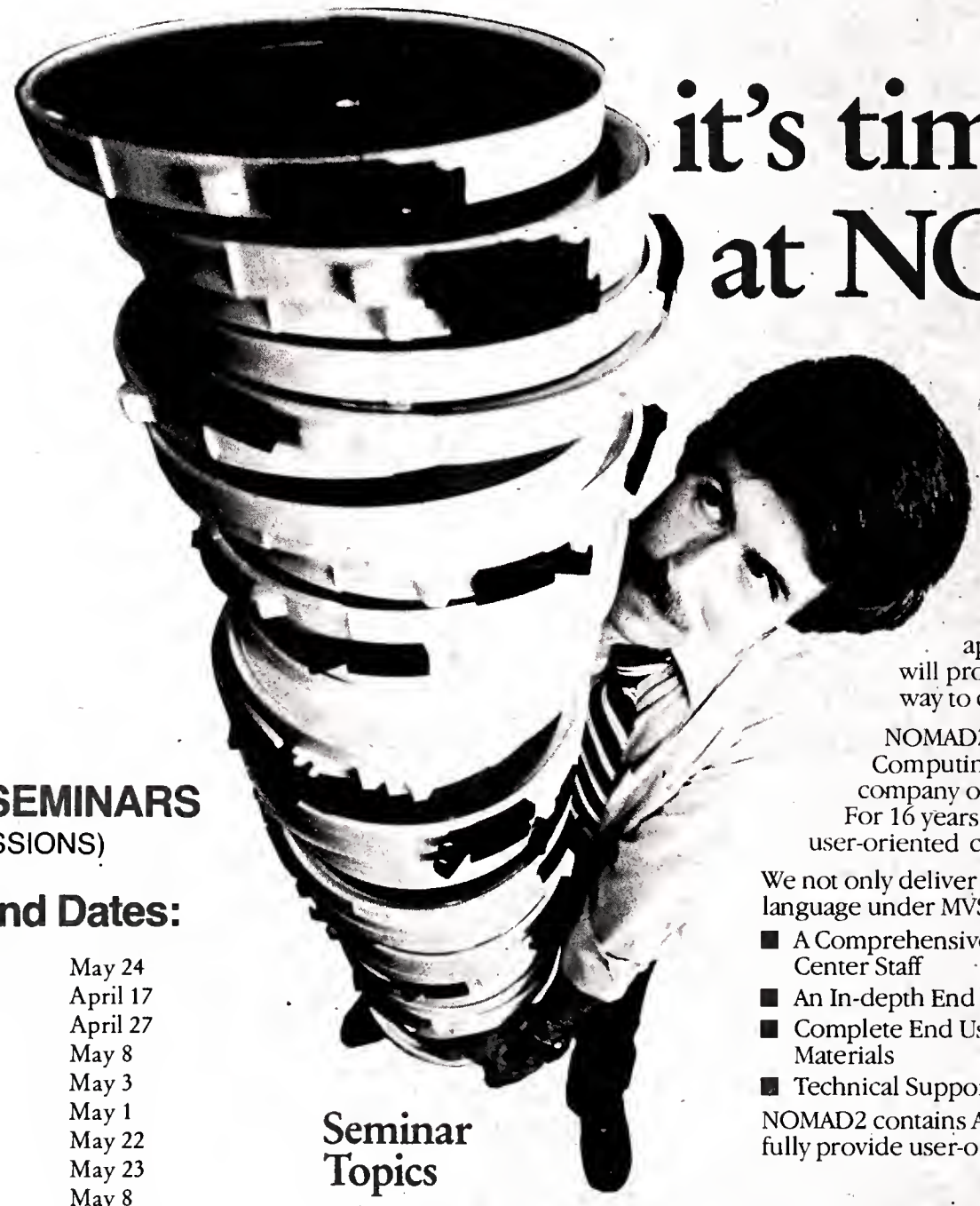
dBASE II can provide you with virtuoso performance, regardless of your application.

For more about dBASE II, contact Ashton-Tate today. 10150 West Jefferson Boulevard, Culver City, CA 90230. (800) 437-4329, ext. 217 . In Colorado (303) 799-4900. In the U.K. (0908) 568866.

ASHTON·TATE

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Suggested retail price for dBASE II is $700.
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MICROCOMPUTERS

SMALL TALK
Eric Bender
CW Senior Editor

AT&T vague on micro plans

Late last month, as AT&T finally unwrapped its first commercial computer offerings — a line of 32-bit systems ranging from a desktop supermicro to a fault-tolerant supermini — the announcements struck many industry analysts as short on technical details.

"It's very typical that AT&T did not release much technical information," noted Brian Boyle of Gnostic Concepts, Inc. in Menlo Park, Calif. Boyle suggested that AT&T's attitude is that "you don't have to worry about details — we're the phone company."

AT&T was vaguest about its new PC Interface, a hardware/software combination designed to connect the 3B2/300 supermicro with personal computers. Unlike the other products, the interface was not on display, and its pricing was not released. The interface is not scheduled to ship until the third quarter.

When available, the interface will allow multiple personal computer users to share files on the central 3B2 and to share the 3B2's peripherals, according to AT&T. The personal computers also will be able to function as Unix terminals, the firm said. The PC Interface will connect through one of three communications options: an RS-232 port, an Omninet or an Ethernet.

Personal computers represent "an installed base we want to serve," said Jack Scanlon, AT&T's vice-president for computer systems, and the PC Interface is "a bridge between Unix and personal computers."

See **AT&T** page 133

Corona adds hard-disk portable to IBM-compatible micro line

By Paul Korzeniowski
CW Staff

WESTGATE VILLAGE, Calif. — Hoping to stay one step ahead of IBM, Corona Data Systems, Inc. has added Corona PPCXT, a hard disk portable personal computer, to its line of IBM Personal Computer-compatible microcomputers.

"The PPCXT addresses user requirements for greater disk storage and offers a host of standard features and expansion capabilities that make it a cost-effective alternative to the IBM Personal Computer, Personal Computer XT and other IBM compatibles," said Lawrence Lotito, vice-president of marketing and strategic planning at Corona.

PPCXT features a 10M-byte hard disk, an Intel Corp. 8088 microprocessor, 256K bytes of random-access memory expandable to 512K bytes, a 9-in. amber monitor, graphics resolution of 640 pixels by 325 pixels, an RS-232C serial port, a Centronics Data Computer Corp.-compatible parallel port and four expansion slots. The portable costs $4,895 and weighs 33 lb.

Software bundled with the system includes Microsoft, Inc.'s GW Basic, Software Systems, Inc.'s Multimate word processing package and Comprehensive Software Support, Inc.'s PC Tutor, an on-line study of basic microcomputer functions.

Docutel Olivetti Corp. has acted as an OEM for Corona's desktops and portable floppy disk computers. "Currently, Olivetti has not ordered the hard disk portable," said Ken Morris, Corona's director of corporate communications. "But we expect them to order it soon."

Docutel Olivetti has not ordered PPCXT because the company has not seen it. "We use Corona's hard disk desktop, but we haven't seen the hard disk portable yet," said George Christianson, product manag-

See **CORONA** page 130

DSS 'Optionware' boasts ease of use

By Paul Korzeniowski
CW Staff

HARTFORD, Conn. — Ian Boyd, president of DSS Development Corp., identified ease of use as the chief reason why many managers do not use microcomputers.

"The industry hasn't grasped that nothing is easy to use if it takes several hours or days to create something useful," Boyd said. "Maybe the industry should adopt a new standard — easy to make useful. The user does not want to buy a Heathkit to build a radio. He wants the radio."

DSS' first product, Optionware, a series of 52 added functions for Lotus Development Corp.'s Lotus 1-2-3, is limited to five commands: enter, review, display, print and graph, Boyd said.

Optionware uses a standard menu and procedure for all modules, which include balance sheet history, regional sales performance, department budgets, sales call reports, fixed asset history and monthly calendar.

"There are some instances where we save a user 320 keystrokes," Boyd said. "The average number of keystrokes each module saves a user is 140."

Users can switch from any Optionware function into Lotus 1-2-3. "A user does not sacrifice any Lotus capability," Boyd said.

"National accounts will be a major market for us," he said. "We are working with two major insurance companies in the Hartford area and tailoring the product for

See **EASY** page 130

INSIDE

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POS system helps Remington shave delays in stock turnover

BRIDGEPORT, Conn. — With a blizzard of some 200,000 sales tickets pouring in annually from 29 regional sales centers, Remington Products, Inc., the electric shaver maker, was snowed under with paperwork. Worse, stock turnover was slowed because of the delay in inventory tracking.

But that was all before the company turned to a point-of-sale (POS) system that translates handwritten sales tickets into data that can be understood by computers. The system uses Micropad, Inc. Micropad data entry terminals, clipboard-size units with a pressure-sensitive writing surface. Clerks in the company's sales centers continue to use paper sales tickets, but the Micropads on which they write the tickets digitize the information and transmit it on a cable connection to their store's Altos Computer Systems, Inc. Model 515 microcomputer, which stores an exact copy of each sales ticket transmitted to it that day.

Those sales tickets are pulled each night, via a modem, by the company's two Altos 8000-10 processors at Remington headquarters here. The headquarters' computers record the sales tickets and return a detailed sales report to each sales center's microcomputer by the time the store's manager opens for business the next morning.

Since conversion to the electronic system, clerks in the regional centers are writing sales tickets that have fewer errors and take less time to complete, according to Remington's data processing manager Jack Welsh.

Welsh said the firm is out from under a load of paperwork that once cost 8 cents per sales ticket to process.

The Micropad system still provides both the customer and the store with a paper copy of the sales ticket, but the Bridgeport headquarters no longer needs to have those forms manually keyed into its computer system, a process that Welsh said caused delays of several days in ticket processing and opened the potential for data entry errors.

"This is one [situation] where the cost justification really came through," Welsh said.

Getting to that point, Welsh admitted, took some doing. The company considered 84 different vendors of POS equipment, companies offering everything from key entry to bar-code reader technology. Remington chose the Micropads over key pad and bar-code reader equipment because the Micropads required a good deal less software to be developed in-house before the system could come on-line.

Because the Remington sales centers service as well as sell the company's products, a system that kept the paper sales tickets was useful because "we wanted to give the consumers information on what we had done [for repairs] and to get their name and address," Lee Feist, Remington's president of retail service operations, said.

Once Micropads were chosen, they were installed on an experimental basis in three Remington sales centers. The Micropads were supported at that time by a small Motorola, Inc. computer system that Welsh said could only support two Micropads per store. When the experiment proved successful, the company decided each store would need up to four Micropads and switched to Altos computers because "we just couldn't wait for Motorola's multiuser system to come out," according to Welsh.

The Altos system was also selected because each store's space limitations required that its computer be located in a shaver repair area, where the equipment would have to withstand the clouds of hair dust produced by shaver cleaning. The Altos computers were recommended by Micropad, Inc. as being able to survive in that environment, Welsh said.

Sales clerks fill out sales tickets by placing the form on the Micropad and printing the needed information into each of its boxes, using a ball-point pen or a pencil. Depending on which of the several "start" boxes is

See **POS** page 134

MICROCOMPUTERS

Apple Access 3270 debuts

CUPERTINO, Calif. — Apple Computer, Inc. has introduced data communications software that is said to allow Apple III personal computers to communicate with all mainframes, minicomputers and personal computers that support IBM 3270 communications.

Called Apple Access 3270, the product works with an Apple Cluster Controller or an Appleline coaxial attachment to emulate an IBM 3278 Model 2 terminal, according to the vendor.

Access 3270 provides Apple III users with a variety of data communications capabilities including text file transfer, on-line data entry, inquiry and response, electronic mail and remote data base access, the firm said.

Apple said that program features include support of data transmission rates from 110 to 9,600 bit/sec; customized Help screens; a comprehensive command file that provides autodial, autologon and unattended operation capabilities; 3278 keyboard emulation and communications options; and the ability to filter control characters to or from the host, the vendor said.

The product is available now for $150.

Apple is located at 20525 Mariani Ave., Cupertino, Calif. 95014.

SYSTEMS

JONOS INTERNATIONAL, INC.
Hard disk portable computer

Jonos International, Inc. has announced C2600, a hard disk portable computer.

The portable features a 3½-in. floppy disk drive, a Zilog, Inc. Z80 microprocessor, 128K bytes of random-access memory, a 10M-byte hard disk and Digital Research, Inc.'s CP/M Plus operating system, the vendor said. C2600 is equipped with two RS-232 serial ports, a parallel port, three expansion slots and a 9-in. CRT, according to the vendor.

C2600 costs $5,695.

Jonos International, 1835 Dawns Way, Fullerton, Calif. 92631.

SCIENTIFIC MICRO SYSTEMS, INC.
MDX-11

Scientific Micro Systems, Inc. (SMS) has announced the MDX-11, a Digital Equipment Corp. LSI-11-type microcomputer system. The MDX-11 reportedly features a 40M-byte Winchester disk drive with an average access time of 45 msec.

The system contains a DEC Q-bus backplane, designed to be configured with the LSI-11/23 or LSI-11/73 CPUs and memory and interface modules. The quad-size backplane reportedly can accommodate up to eight dual-height Q-bus cards to provide extra functions such as graphics, communications interfaces and additional memory.

The 35-lb desktop microcomputer includes an 8-in. floppy disk drive for backup and software updating that supports DEC and IBM formats and stores 1.2M byte per disk. The floppy and Winchester drives operate with the SMS FWD0106 disk controller, which operates in either a DEC-RX02-compatible mode or an extended mode that provides additional commands for read/write of the fixed disk and data transfer operations, the vendor said.

The MDX-11 is said to feature compatibility with existing SMS systems and DEC operating systems that include RT-11, RSX-11M and RSX-11M-Plus. According to the company, the S & H Computer, Inc. TSX-Plus operating system makes the MDX-11 particularly useful for small business applications.

Available now, the system is priced at $10,600.

Scientific Micro Systems, 777 E. Middlefield Road, Mountain View, Calif. 94043.

SAGE COMPUTERS, INC.
Unbundled software

Sage Computers, Inc. has lowered the price of its Model II and Model IV multiuser supermicrocomputers by unbundling three programs: Pascal, 68000 assembler language and Timberline Systems, Inc. spreadsheet.

Sage Models II and IV feature 256K bytes of random-access memory (expandable to 512K bytes); Motorola, Inc. 68000 microprocessors; the P-system operating system; Pascal; Word7, Inc.'s word processing software; and Teletalker, Inc. communications software, the vendor said. Sage II is equipped with one or two 640K-byte floppy disk drives. Sage IV has a 12M-byte hard disk and one 640K-byte floppy disk drive.

Prices for the two models range from $3,200 to $7,300.

Sage Computers, 4905 Energy Way, Reno, Nev. 89502.

AMERICAN COMPUTER GROUP, INC.
Quickplan

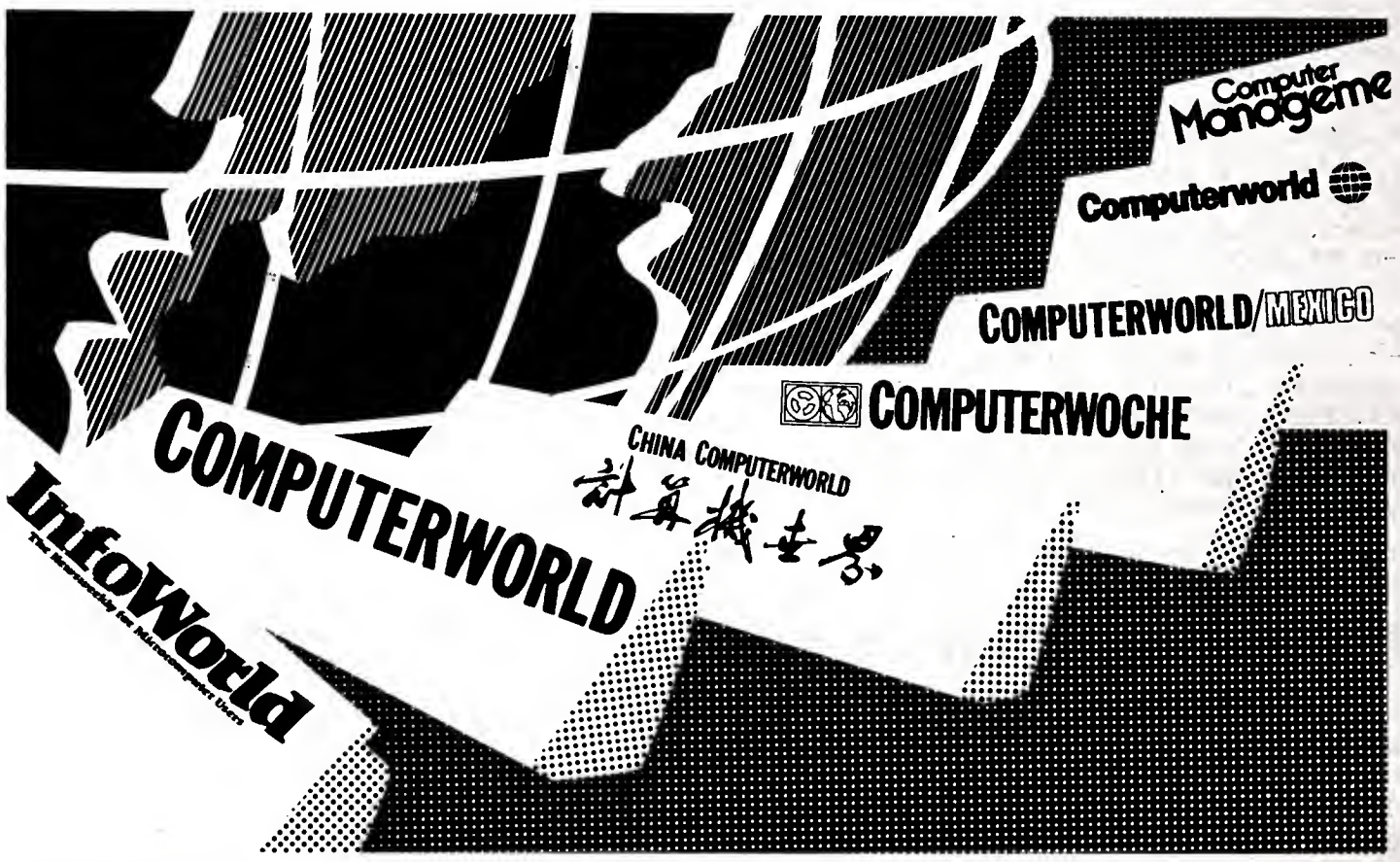
American Computer Group, Inc. has introduced a system designed for project management using the IBM Personal Computer XT.

Quickplan is a display and report writer that is said to permit a manager to customize specific data on specialized reports. The program's graphics provide the capability to draw network logic charts.

The vendor is offering the software as part of a package built around an IBM Personal Computer

Continued on page 122

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MICROCOMPUTERS

Continued from page 118

XT. The basic package consists of an XT with a monochrome monitor, 512K bytes of memory, a 10M-byte hard disk, an asynchronous adapter, a 128K- to 260K-byte diskette, a graphics printer, IBM DOS 2.0 and Quickplan. Prices start at $7,727. Prices for a color version start at $8,081.

American Computer Group, P.O. Box 68, Kenmore Station, Boston, Mass. 02215.

STEP ENGINEERING
PC7

Step Engineering has announced PC7, a turnkey engineering workstation based on the IBM Personal Computer.

PC7 links the Step-7 firmware integration test system, an engineering firmware and software package, with the IBM Personal Computer. The workstation can define bit-slice designs, assemble programs, format object code and debug micro code.

PC7 is priced from $10,000.

Step Engineering, 757 Pastoria, Sunnyvale, Calif. 94088.

PRINTERS/PLOTTERS/ PERIPHERALS

SWINTEC CORP.
Compumate 2100

Swintec Corp. has announced the Compumate 2100, described as a letter-quality daisywheel printer.

Compumate 2100 is said to feature both parallel and serial ports, interchangeable daisywheels, underscoring, bold and shadow printing, superscripts and subscripts. It is a logic-seeking printer with a typical speed of approximately 20 char./sec.

The printer is compatible with a variety of microcomputer systems, the vendor said.

The Compumate 2100 printer is priced at $649.

Swintec, P.O. Box 421, 23 Poplar St., East Rutherford, N.J. 07073.

Martec Associates, Inc.
CP80/1

Martec Associates, Inc. has introduced CP80/1, an 80-col. dot matrix printer.

CP80/1 features friction tractor and adjustable tractor, plus Ascii character, italic and alphanumeric fonts, the vendor said. A software package enables CP80/1 to emulate an IBM 5152002 graphics printer, according to the vendor.

CP80/1's interface is compatible with Apple Computer, Inc., IBM and Radio Shack personal computers.

The printer costs $330.

Martec Associates, PPP Division, 1510 Jarvis Ave., Elk Grove Village, Ill. 60007.

BOARD-LEVEL DEVICES

GVC, INC.
GVC-16

GVC, Inc. has introduced a demand-paged, virtual memory multiprocessor board that uses National Semiconductor Corp.'s 16032 32-bit microprocessor.

GVC-16 features 10-MHz speed, 512K bytes of dual-ported memory with byte parity (expandable to 2M bytes), 32K bytes of erasable programmable read-only memory and compatibility with Intel Corp.'s Multibus, the vendor said.

GVC-16 costs $3,295.

GVC, 222 Third St., Cambridge, Mass. 02142.

AUXILIARY EQUIPMENT

SYNETIX, INC.
PC-Handler

Synetix, Inc. has introduced the PC-Handler, a peripheral said to link up to four IBM Personal Computers in a shared-resources network.

The product enables users to cut costs by sharing a printer, modem, hard disk or other peripheral. It offers two serial ports, four IBM-compatible parallel ports, a clock and calendar, spooling capability and disk emulation, Synetix said.

The product is offered with 64K bytes of memory, expandable to 512K bytes.

The PC-Handler is priced at $795.

Synetix, 10635 N.E. 38th Place, Kirkland, Wash. 98033

BMH CO., INC.
Addtrace 1

BMH Co., Inc. has introduced Addtrace 1, a microprocessor machine language programming and troubleshooting aid.

Addtrace 1 monitors an address bus, enabling the user to trace the path of a program, the vendor said. The product allows observation of pulse duration and timing relationships with up to six control signals for each digit selected over full 64K-byte memory sections.

Addtrace 1 costs $199.50.

BMH, 224 Vassar St., Reno, Nev. 89502.

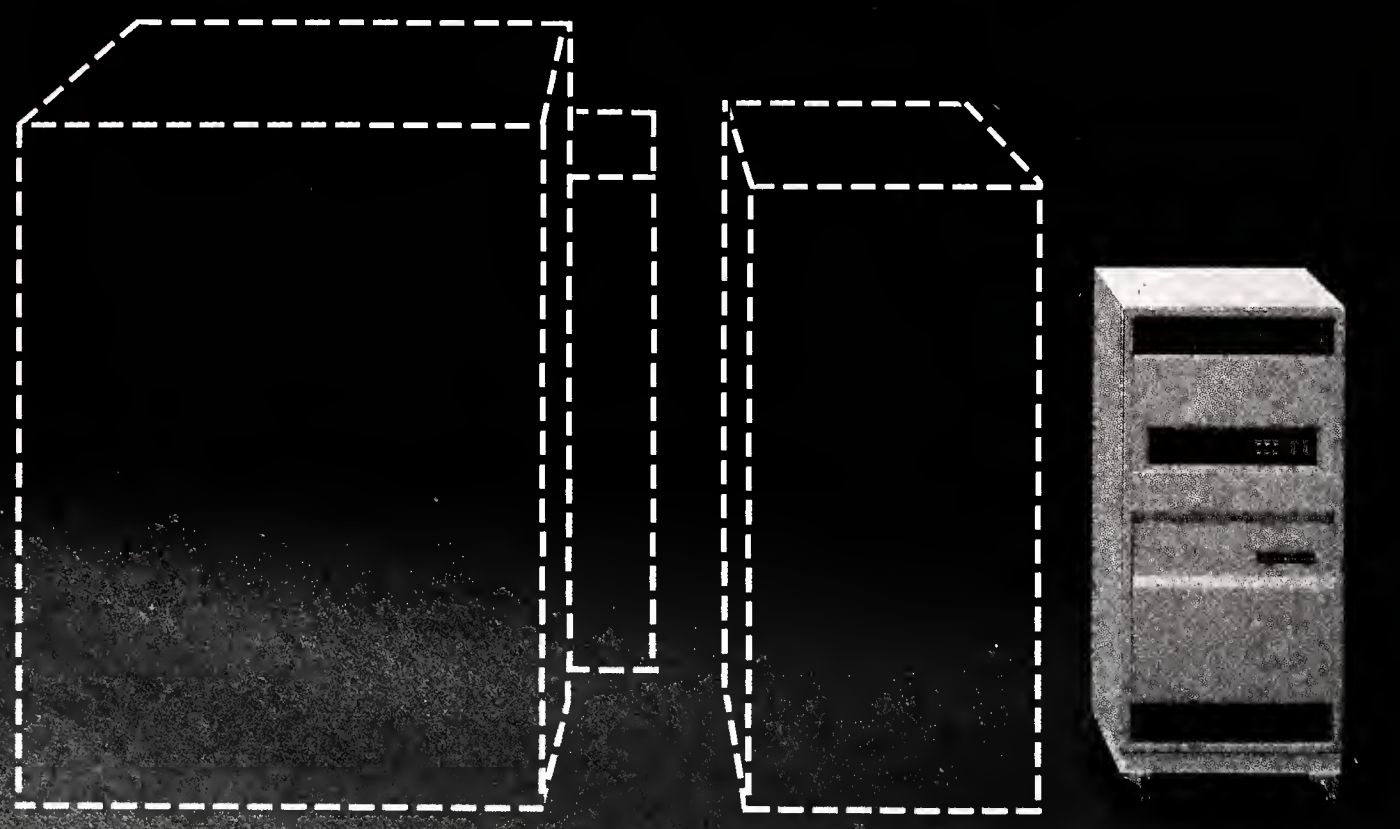
SOFTWARE

UNIFY CORP.
Unify

Unify Corp. has announced that Unify, its relational data base management system, is available for Apple Computer, Inc.'s Lisa 2.

The program features application development tools, such as Sequel 2,

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Weights listed are approximate and include smallest, standard battery (Sola, 15 min; Topaz, 20 min; Exide Electronics, 5 min) according to published literature of the manufacturer available at time of ad preparation. Battery size and weight may vary depending on system requirements. Illustrations show typical configurations and are scaled based on smallest, standard system (electronics and battery) dimensions according to published literature of manufacturer available at time of ad preparation. Battery housing of system may vary depending on system requirements.

MICROCOMPUTERS

C and RM Cobol interfaces; form generation capability; a query-by-form feature; and report generation and security features, the vendor said.

Unify requires 256K bytes of random-access memory, a 5M-byte hard disk and a version of Unix that works on the Lisa.

The package costs $1,995.

Unify, 9570 S.W. Barbur Road, Portland, Ore. 97219.

ALLOY COMPUTER PRODUCTS, INC.
TIP-Six

Alloy Computer Products, Inc. has enhanced the software that operates its PC Backup tape cartridge backup system. The enhancement, called TIP-Six, will be bundled in with all new models of PC Backup.

According to the vendor, the 16-bit TIP-Six provides automatic subdirectory backup, date and time stamping of files and selective backup based on file names.

PC Backup runs under IBM's PC-DOS and Digital Research, Inc.'s CP/M 86 operating systems. TIP-Six will be available free of charge to TIP-Four-based PC Backup users who purchased their systems this year prior to the introduction of TIP-Six. Users of PC Backup models purchased over the last three to four years will be able to upgrade to TIP-Six at a cost of $50.

Alloy Computer Products, 100 Pennsylvania Ave., Framingham, Mass. 01701.

INTERNATIONAL ELECTRONIC MACHINERY, INC.
Fortran-77 compiler

International Electronic Machinery, Inc. has introduced a Fortran-77 compiler for Hewlett-Packard Co. Series 200 desktop computers.

According to the vendor, the product was developed for the HP 9816, 9826 and 9836 computers.

The compiler is priced at $1,200 in the U.S. and Canada and $1,500 elsewhere.

International Electronic Machinery, P.O. Box 1818, Fort Collins, Colo. 80522.

ASPECT
GL/M

Aspect has announced the Graphics Language for Microcomputers (GL/M) for the IBM Personal Computer.

With GL/M, users can create customized graphics on a variety of daisywheel and dot matrix printers.

GL/M comes in 5¼-in. or 8-in. formats for Digital Research, Inc. CP/M and CP/M 86 and IBM PC-DOS operating systems. Any Diablo Systems, Inc.-compatible daisywheel printer can be used.

GL/M is priced at $195, the vendor said.

Aspect, 167 Worcester St., Wellesley, Mass. 02181.

FUTURE COMPUTING, INC.
Software Perspectives 84

Future Computing, Inc. has announced Software Perspectives 84, a portfolio of reports, newsletters and industry forums focusing on the office personal computer software marketplace.

The portfolio includes five specialized monthly newsletters, including "Softwareviews," "Officeviews," "Homeviews," "Retailviews" and "Technologyviews." Each 16-page issue focuses on a key segment of the personal computer industry, the vendor said.

The package also includes access to Officebase, an inquiry service, and two reports, *Office Personal Computers: A Market Overview* and *Office Personal Computers: Software.*

Software Perspectives 84 is priced at $7,500 till June 1, after which the price increases to $9,000.

Future Computing, 900 Canyon Creek Center, Richardson, Texas. 75080.

SMOKE SIGNAL BROADCASTING, INC.
CCSM

Smoke Signal Broadcasting, Inc. has announced that Comp Consultants Standard Mumps (CCSM) is available for its entire line of high-performance, multiuser, multitasking microcomputers.

The price for CCSM is $800, according to a vendor spokesman.

A complete system from Smoke Signal with one terminal, 16 I/O ports and 40M bytes of disk storage is priced under $13,500, according to the spokesman.

Smoke Signal, 31336 Via Colinas, Westlake Village, Calif. 91362.

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COMPUTERSERVICESREPORT
January 1, 1984
Comshare lands a sweet one.

The Detroit News
Jan 4, 1984
A calculated decision

Business Day
The New York Times
Wednesday, January 4, 1984
Comshare, I.B.M.

THE ANN ARBOR NEWS Tuesday, January 3, 1984
Comshare signs agreement with IBM

News release
COMSHARE

IBM AND COMSHARE SIGN
COMPLEMENTARY MARKETING AGREEMENT

ANN ARBOR, Mich.--The IBM Corporation and Comshare, Incorporated have completed an agreement identifying Comshare as a Complementary Marketing Organization. Comshare field representatives will assist IBM in situations where a 4300 system can be justified by a System W decision. The broad data processing knowledge and products from IBM and the specialized decision support software and skills of Comshare complement each other for business problem solving.

In a Computerworld editorial published January 16, 1984, the expected result of the IBM/Comshare agreement was stated as follows: ". . .it is safe to say that users will be the big winners in this latest IBM marketing foray."

Decision support software is in popular demand in medium and large companies across all industries. The primary market for System W is where an Information Center is being employed or where a company desires productivity software satisfying the information modeling, analysis and reporting needs of business planners and managers.

Columbus Citizen-Journal
Jan 7, 1984
Comshare, IBM sign pact

MANAGEMENT TECHNOLOGY FEBRUARY 1984
Pushing software
Comshare's IBM connection

COMPUTERWORLD EDITORIAL JANUARY 16, 1984
Interesting deal

Electronic News
JANUARY 9, 1984
Comshare, IBM Plan 'Complementary' Mktg.

The Phoenix Gazette
Jan. 10, 1984
IBM, Comshare complete deal

MIS Week Wednesday, January 11, 1984
IBM, Comshare Sign 'System W' Sales Pact

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Or simply mail your business card to: Comshare, P.O. Box 1588, Ann Arbor, Michigan 48106. We'll do the rest.

SYSTEM W DECISION SUPPORT SOFTWARE
COMSHARE

TOOLS from page 123

MICRO SOFTWARE ASSOCIATES, INC.
Practicalc II

Micro Software Associates, Inc. has announced Practicalc II, a spreadsheet that runs on Apple Computer, Inc.'s Apple II+ and Apple IIe. Practicalc features word processing capabilities, advanced editing, variable column width and upper- and lowercase entry. The program features alphanumeric search and sorting, prompts for entry during calculation and printing of list formulas.

Practicalc II costs $69.95

Micro Software Associates, The Silk Mill, 44 Oak St., Newton Upper Falls, Mass. 02164.

DA-TECH CORP.
DA-6502B

Da-Tech Corp. has announced DA-6502B, a circuit emulator that facilitates software development for microcomputers using Moss Technology, Inc. 6502 microprocessors.

The system supports applications such as breadboard debugging, software debugging, production testing, training and field service, the vendor said. The emulator can perform read and write diagnostics on any preselected range of user random-access memory (RAM), provide a minimum check sum on user memory space and download diagnostic code from the emulator to user RAM.

DA-6502B costs $595.

Da-Tech, 92 Steamwhistle Drive, Ivyland, Pa. 18974.

WYSE TECHNOLOGY, INC.
Wyseword on WY-300

Wyse Technology, Inc. has announced that its firmware package Wyseword will now run on its WY-300 color display station.

It is said to simplify the keyboard operation of Micropro International Corp.'s Wordstar by reducing multiple keystroke commands, allowing the use of all editing keys.

The WY-300 display station features an 80-col., high-resolution, eight-color display and contains a soft character generator that allows up to 256 custom symbols to be loaded from the host computer. It also includes a predefined set of symbols that are stored permanently in read-only memory, which are loaded into the soft character generator automatically upon power-up, according to the vendor.

The WY-300 and Wyseword are priced at $1,295 and $100, respectively.

Wyse Technology, 3040 N. First St., San Jose, Calif. 95134.

MICRO ARCHITECT, INC.
IOAS-3

Micro Architect, Inc. has introduced an Integrated Office Automation System (IOAS) for the IBM Personal Computer, Personal Computer XT and compatibles.

According to the vendor, the IOAS-3 consists of a data base manager, a word processor and a spreadsheet. The system requires 128K bytes of memory and any version of the IBM PC-DOS. It is available in three versions: IBM Personal Computer XT, PCjr with monitors and PCjr with TV display. Both monochrome and color monitors are supported.

The IOAS-3 is priced at $199. A demonstration diskette is available at a cost of $15 for the Personal Computer XT version and $9 for the IBM PCjr monitor version.

Micro Architect, 6 Great Pine Ave., Burlington, Mass. 01803.

CENTERPOINT COMPUTER APPLICATIONS
Sign-Plot

Centerpoint Computer Applications has introduced a plotter program for the IBM Personal Computer that allows the user to produce six different letter font styles as well as custom fonts and symbols.

Called Sign-Plot, the program includes upper- and lowercase characters, punctuation and numbers in each font style as well as vertical and horizontal positioning of text.

Sign-Plot is designed to drive a variety of pen plotters, including models from Hewlett-Packard Co.; Houston Instruments; Enter Computer, Inc.; Amdek; Strobe, Inc.; Mannesman Tally Corp.; Apple Computer, Inc.; and California Computer Products, Inc. It requires 128K bytes of memory and two disk drives. Sign-Plot is priced at $149.

Centerpoint, 500 N. Michigan Ave., Chicago, Ill. 60611.

DATAPRO RESEARCH CORP.
Software directories

Datapro Research Corp. has introduced three new software directories.

The three directories are for Apple Computer, Inc.'s Apple II, II+, IIe and III; the IBM Personal Computer, Personal Computer XT and compatible systems; and a Digital Research, Inc. CP/M guide to software for more than 130 different microcomputer systems compatible with CP/M.

Each directory is priced at $19.95.

Datapro Research, 1805 Underwood Blvd., Delran, N.J. 08075.

LOGICAL SOFTWARE, INC.
Menulogic

Logical Software, Inc. has introduced Menulogic, a software product that allows users of the IBM Personal Computer to custom-design full screen menus.

According to the vendor, menus can be created using the full Ascii character set, including graphics characters with color, intensity and blinking.

If you sell large systems software — quick — what will all your prospects be doing on June 20, 1984?

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SAN FRANCISCO/Bill Healey, Beverly Raus (415) 421-7330
LOS ANGELES/Bill Healey, Ruth Gordon (714) 261-1230

MICROCOMPUTERS

Menulogic runs under IBM's PC-DOS 1.1 or 2.0 or the USCD P-system, requires 64K bytes of random-access memory and uses either monochrome or color display.

Menulogic, on diskette with a user's manual, is priced at $45.

Logical Software, 15731 Daleport Circle, Dallas, Texas 75248.

DATA GENERAL CORP.
DEC to market Friday!, Dbase II

Data General Corp. has announced it will market two Ashton-Tate programs, Friday! and Dbase II, for use on its Desktop Generation computers.

Friday! is an electronic file management system said to provide integrated file capability. Dbase II is a relational data base management system.

Friday! is being offered by Data General for $295, in a Microsoft, Inc. MS-DOS version only. Dbase II is being offered in MS-DOS and Digital Research, Inc. CP/M 86 versions, both priced at $695.

DG, 4400 Computer Drive, Westboro, Mass. 01580.

ARTEMIS SYSTEMS, INC.
Metalogic

Artemis Systems, Inc. has announced Metalogic, a three-dimensional graphics program for users of the Apple Computer, Inc. Apple II+ and Apple IIe microcomputers.

A vendor spokeswoman said Metalogic is a set of ampersand commands that interface Basic programs to Sublogic Corp.'s A2-3D2 interpreter system to produce three-dimensional color graphics. By embedding "&" statements in a regular Basic program, individual objects or complex animated scenes can be generated.

The system requirements are the Sublogic A2-3D2 interpreter, Apple II+ with 16K-byte random-access memory card or Apple IIe and Apple DOS 3.3 operating system.

Metalogic is priced at $75 separately, or $180 for Metalogic plus the complete A2-3D2 graphics package.

Artemis Systems, 41 Parkview Drive, Millburn, N.J. 07041.

COMPUCORP
Level E Omega

Compucorp has announced Level E Omega, the latest version of its Omega office automation software for Compucorp's 600 and 700 series processors, in stand-alone or local-area network configurations.

The vendor said 14 improvements and 11 new features have been included with Level E Omega. The package includes word processing, mathematical calculations, forms creation, data entry, index access and data base management functions.

The enhancements and additions reportedly include an instant page format feature that can restructure an entire document even when only one page is format-changed, the ability to edit independent columns of text with right justification and proportional spacing and a phonetic speller feature that will search for a word after allowing the operator to spell the word phonetically, according to the vendor.

The standard Level E Omega package is priced at $650 for each stand-alone processor, according to a spokesman. Compucorp also charges a software license fee of $595 for each new retail customer.

Compucorp, 2211 Michigan Ave., Santa Monica, Calif. 90404.

SMC SOFTWARE SYSTEMS
Thoroughbred/OS

SMC Software Systems, a division of Science Management Corp., has announced the availability of Thoroughbred/OS on the IBM Personal Computer XT.

The vendor said the new software will allow users of the IBM computer, as well as other computers that support Microsoft, Inc.'s MS-DOS or PC-DOS, to run all business applications programs written in Basic Four Corp.'s Business Basic. The retail price of the software is $795.

SMC Software Systems, 1011 Rt. 22, Bridgewater, N.J. 08807.

SCHUHARDT SOFTWARE SYSTEMS, INC.
Intesoft series

Schuhardt Software Systems, Inc. has introduced the Intesoft series, a system for the IBM Personal Computer that allows office automation software packages to be used as independent modules or as an integrated system, according to the vendor.

The components of the Intesoft series are the Intemate, an integration and application management system, and Inteword, a word processing system. Intevate, an interactive applications generator, will be available by June. Intemate costs $249, Inteword is $395, and Intevate will be $249.

Schuhardt Software Systems, 515 Northgate Drive, San Rafael, Calif. 94903.

KRONOS, INC.
IBM PC Terminal Emulator, High Level Communications Interface, File Transfer, Host Emulator

Kronos, Inc. has introduced four software modules designed to facilitate the integration of the vendor's Timekeepers product, a stand-alone dedicated microcomputer for time accounting use.

One module, the IBM PC Terminal Emulator, provides emulation capabilities for users who prefer to use an IBM Personal Computer instead of a local video terminal with the Timekeepers unit. Use of a Personal Computer reportedly enables the user to write the time and attendance data in the Timekeepers' memory to diskette for permanent storage.

Continued on page 126

This Control Concepts 3270 compatible terminal keeps Rand McNally-TDM moving in the fast lane.



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MICROCOMPUTERS

Continued from page 125

The High-Level Communications Interface module is said to provide programmers with a library of communications routines that implements the vendor's error-protected protocol.

The File Transfer package reportedly allows the user to transfer employee data from multiple remote Timekeepers to an IBM Personal Computer at a central location via telephone lines using the error-protected protocol.

The IBM PC Host Emulator module is a menu-driven program said to allow users to access reports available from Timekeepers. The software prompts users by asking them what function they would like to perform, then accesses its own programs automatically to perform the task.

IBM PC Terminal Emulator is priced at $180. High-Level Communications Interface costs $360. File Transfer, which includes the terminal emulator and communications interface modules, costs $540. The IBM PC Host Emulator, including the three other modules, costs $720.

Kronos, 62 Fourth Ave., Waltham, Mass. 02154.

ENERTRONICS RESEARCH, INC.
Energraphics version

Enertronics Research, Inc. has introduced a new version of Energraphics, a graphics software package that combines business graphics, statistical analysis, drawing functions, word processing, symbol and font generation, presentation and three-dimensional plotting of surfaces.

The vendor said the new version allows for rotation and movement of entire regions of the screen, providing 1,000-times zoom magnification.

Energraphics runs on the IBM Personal Computer and Personal Computer XT and compatibles. It requires 128K bytes of random-access memory and an adapter board. It costs $350 and is $450 with the plotter.

Enertronics Research, Suite 207, 150 N. Meramec St., St. Louis, Mo. 63105.

FORTE DATA SYSTEMS, INC.
Forte-Call

Forte Data Systems, Inc. has announced Forte-Call, a software package to tie remote personal computers and terminals into an organization's mainframe-based network.

The vendor said Forte-Call requires an IBM Personal Computer or Personal Computer XT equipped with either of Forte's 3270 emulation boards: Forte PJ or Forte PC78-2. The boards allow the computer to emulate an IBM 3278 or 3279 terminal when linked to an IBM mainframe.

Forte-Call is software-based and requires no additional hardware to operate. It is priced at $295.

Forte Data Systems, 1500 Norman Ave., Santa Clara, Calif. 95050.

STAFF COMPUTER TECHNOLOGY CORP.
The Key

Staff Computer Technology Corp. has introduced a computer security device that reportedly can be used with any computer with an RS-232 serial port.

The Key is a hardware module designed to prevent software piracy, a vendor spokesman said. The interactions of The Key and the software are used to form inquiry/response pairs. The use of many inquiry/response pairs reportedly enhances the security.

The Key sells for $210 each in quantities from one to 99 and for $195 in quantities of 100 or more, the spokesman said.

Staff Computer Technology, P.O. Drawer B, Del Mar, Calif. 92014.

MYCROFT LABS, INC.
Compat

Mycroft Labs, Inc. has introduced Compat, a utility that allows an Otrona Corp. Attache portable microcomputer to copy files to and from various manufacturers' 5¼-in. disk formats.

The utility allows the user to copy from Otrona to another implemented manufacturer's format, copy to Otrona format from another manufacturer's format and copy between two non-Otrona formats.

Compat reads the following implemented MS-DOS or PC-DOS 5¼-in. diskette formats: single-sided, 8-sector; single-sided, 9-sector; double-sided, 8-sector; double-sided, 9-sector.

The list price of Compat for the Otrona Attache is $195, which includes a program disk and a reference manual.

Mycroft Labs, P.O. Box 6045, Tallahassee, Fla. 32314.

AXELSOFT
Cross/file

Axelsoft, a software division of Axel Johnson Corp., has announced Cross/file, a combination file editor/reformatter.

Cross/file eliminates the need to retype information into standard personal computer application programs from external sources (such as mainframe computers, incompatible microcomputers and commercial data bases), according to the vendor.

Axelsoft said that with Cross/file, the user can pick up any information displayed on the screen. Type of file format becomes irrelevant, the company said, and any kind of communication protocol can be used as long as the communication program is able to store standard Ascii files on disk.

Cross/file was designed to allow the use of data from other computers as input to standard spreadsheet, data base, business graphics or word processing programs. It is available in Microsoft, Inc.'s MS-DOS and Digi-

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MICROCOMPUTERS

tal Research, Inc.'s CP/M 80 and 86 versions. It is compatible with Visicorp's Visicalc, Lotus Development Corp.'s 1-2-3, Microsoft's Multiplan and several other application programs, according to Axelsoft.

The program can be used with the IBM Personal Computer and Personal Computer XT, the Digital Equipment Corp. Rainbow, the Wang Laboratories, Inc. Professional Computer, the Panasonic Co. Personal Computer or the Ericsson Step/one.

Cross/file is priced at $195, the vendor said.

Axelsoft, Axel Johnson, 666 Howard St., San Francisco, Calif. 94105.

JMI SOFTWARE CONSULTANTS, INC.
Bastoc 1.4

JMI Software Consultants, Inc. has introduced a new version of Bastoc, a software tool that provides Basic facilities on Unix and other systems supporting C compilers.

The vendor said Bastoc 1.4 translates programs written in one of several varieties of Basic to C language. It also now supports the complete Microsoft, Inc. Disk Basic dialect.

Binary versions are available for the IBM Personal Computer (PC-DOS, Co-Idris), the Radio Shack TRS-80/16 (Xenix), Idris on the Digital Equipment Corp. PDP-11 and Motorola, Inc. MC68000, Unix Versions 6 and 7 on the PDP-11 and the Apple Computer, Inc. Lisa (Uniplus). Any system supporting a standard C compiler is a potential host for Bastoc. Single-quantity price for Bastoc 1.4 is $350.

JMI, Software Consultants, 1422 Easton Road, Roslyn, Pa. 19001.

THE SANTA CRUZ OPERATION, INC.
Xenix for Lisa 2

The Santa Cruz Operation, Inc. has announced that it will offer Microsoft, Inc.'s Xenix operating system for use on the Apple Computer, Inc. Lisa 2 microcomputer.

Other Xenix-compatible applications packages offered include the Multiplan Electronic Worksheet, the Uniplex word processing system, the Informix relational data base management system, Level II Cobol and the Forms 2 and Animator Cobol development tools, the vendor said.

The Xenix operating system is available for $795. The company also offers the Xenix Software Development System for $595, the Xenix Test Processing System for $495 or all three systems for $1,495.

The Santa Cruz Operation, P.O. Box 1900, 500 Chestnut St., Santa Cruz, Calif. 95061.

CLEAR SYSTEMS
Calendar/1

Clear Systems' Calendar/1, a program that prints or displays calendars of events in a standard, graphics monthly format, is now available for the IBM Personal Computer operating under PC-DOS or compatible systems.

Calendar/1 can be used as an appointment book and production schedule for one or many people and/or tasks. Multiple calendars are kept separate or can be merged into a master calendar. Files of annual events can be automatically merged with files of one-time-only events.

In addition, calendars can be tailored to the needs of the individual or organization by means of a parameter file that gives the user control over all options and defaults, including size, format and printer characteristics, the company added.

Calendar/1 is priced at $95.

Clear Systems, Suite 404, 309 Santa Monica Blvd., Santa Monica, Calif. 90401.

SYSTEM/Z, INC.
Basic/z enhancement

System/z, Inc. has announced a new version of its Basic/z compiler.

The enhanced compiler offers file locking, record locking and support for multiple devices, the vendor said. The compiler supports cursor positioning, screen attributes, input masking, screen editing of console input at run time, alphanumeric labels, user-defined functions and a program editor that tests syntax as the user types, according to the vendor.

It works with Digital Research, Inc.'s CP/M, MP/M II, CP/M 80 and CP/M 86 and Musys Corp.'s Turbodos operating systems and costs $345.

System/z, P.O. Box 11, Richton Park, Ill. 60471.

DIVERSIFIED DATA RESOURCES, INC.
Acom; Acomft; Acomhft

Diversified Data Resources, Inc. has announced the Acom program, which reportedly provides error-free data transfer from personal computer to personal computer or from personal computer to host mainframe. According to the vendor, Acom transmission is error-free, even if a line is dropped, a plug pulled or a modem jarred during file transfer. Three versions of Acom are available.

Acom, a terminal emulator with no file transfer capability, allows an IBM Personal Computer or Personal Computer XT to emulate IBM 3277, 3278 or 3279 terminals. No protocol converter is required to allow an IBM Personal Computer XT to emulate a Digital Equipment Corp. VT52 or VT100 terminal, the vendor said.

Acomft permits an IBM Personal Computer XT to transmit files to another IBM Personal Computer XT, according to a spokesman for Diversified Data Resources. Acomhft is said to be the mainframe software required for Acomft to transmit or receive Vsam, Isam or SAM files to or from an IBM or compatible

Continued on page 130

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ZENTEC

MICROCOMPUTERS

Continued from page 127
host CPU. Acom, Acomft and Acomhft costs $120, $240 and $3,000, respectively.

Diversified Data, Suite 7, 25 Mitchell Blvd., San Rafael, Calif. 94903.

CHAMPS, INC.
Champs/A and Champs/E

Two programs designed to standardize information handling and print reports for athletic and activity office administrators have been introduced by Champs, Inc.

Champs/A categorizes information for scheduling, calendars and contracts. Champs/E provides a system for maintaining up to 25 items of student information. They are written for Apple Computer, Inc. and Radio Shack TRS-80 micros. Prices are $395 each; a 5% discount applies when buying both.

Champs, P.O. Box 24054, Apple Valley, Minn. 55124.

GRAPHIC COMMUNICATIONS, INC.
Graphwriter

Graphic Communications, Inc. has introduced Graphwriter, a graphics software package for creation of 35mm slides which supports Polaroid Corp.'s Palette 35mm slide producer.

According to the vendor, Graphwriter produces graphs and charts for business presentations and reports. The package includes 24 different format programs, capable of producing over 50 graphs.

The product is available for the IBM Personal Computer and the Digital Equipment Corp. Rainbow under the Softech Microsystems, Inc. P-system.

Graphics Communications is offering the Graphwriter combination set — normally $595 — and the Polaroid Palette Image Recorder — $1500 — for $1895.

Graphic Communications, 200 Fifth Ave., Waltham, Mass. 02154.

INNOVATIVE SOFTWARE
Total Information Management IV

Innovative Software has announced Total Information Management (TIM) IV, an enhanced version of its data base manager program for the IBM Personal Computer and compatibles.

The vendor said the major enhancements to TIM IV allow transfer of data among files while performing calculations and/or accumulating totals in a separate but related file.

TIM IV runs under PC-DOS on IBM Personal Computers and under Microsoft Inc.'s MD-DOS on compatibles, requiring 128K bytes of random-access memory (RAM) and two disk drives. It also runs under Digital Research, Inc.'s CP/M and MP/M with two disk drives and 64K bytes of RAM. It costs $495.

Innovative Software, No. 380, 9300 W. 110th St., Overland Park, Kan. 66210.

INNOVATIVE SOFTWARE
Fast Graphs Version 2.0

Innovative Software has announced Version 2.0 of Fast Graphs, a package for IBM's Personal Computer.

The vendor said Version 2.0 enhancements include smoother curves and a plotting speed five times faster than the earlier version.

Fast Graphs can plot four different charts on one sheet of paper, with the combined use of up to 16 patterns and eight colors, three character

Continued on page 131



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Okidata's Pacemark 2350 and 2410 dot matrix printers.

They'll not only help you *keep* pace with your world, they'll help you set new and exciting ones. In print speed. In print quality. And in vastly increased compatibility and capability.

Take throughput. The 2350 and 2410 can quickly get you out of the waiting game to where you're *really* cranking it out. And with flexibility, too: up to 5 pages per minute.

But wait. Cranking *what* out, you may ask? A single, restrictive printing mode? No way. The 2410 can give you DP, draft, and a correspondence quality that truly rivals the daisywheel.

And the 2350 and 2410 can both print at up to 350 cps. While producing 120 to 420 lines a minute for you. With bidirectional printing and short line seeking logic. And both high speed horizontal and vertical slew.

PC COMPATIBILITY.
SOFTWARE COMPATIBILITY.

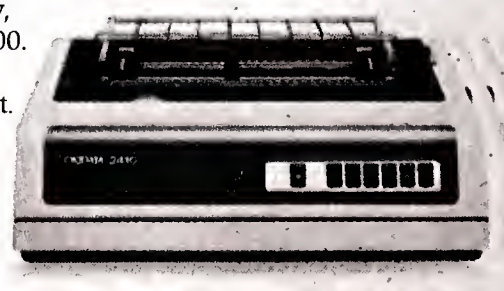
The 2350 and 2410 use industry standard interfaces making them hardware compatible with most mini and microsystems on the market today. In addition, they are supported on the menus of most of the important software being offered to microsystem users like Visicalc, Lotus 1, 2, 3, DBASE 2, Peachtree 500 and General Ledger, MultiMate WP, Wordstar, etcetera, etcetera.

But wait, there's more. Like an outstanding all points addressable graphics capability with 144 x 144 dots per inch resolution.

Two color printing for highlighting. Down line loadable font sets for flexibility. Subscripts and superscripts so your scientific and technical usage won't bog down. Six-part forms handling. The capability to print 132 columns on eight-inch paper using 17.1 characters per inch to save paper costs and make output easier to handle.

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No doubt about it, the quicker the pace at your place, the more you need Pacemark from our place. For more information, call toll free 1-800-OKIDATA.
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Or write OKIDATA, Mt. Laurel, NJ 08054.



OKIDATA
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We're keeping pace with your business.

EASY from page 117

their use. If any company buys 300 copies of a module, we will work with it to tailor the module to its needs."

Communications capability will be added when Lotus' Symphony is released.

The first 32 applications will be available in April; 20 additional applications will be ready by June, according to Boyd. "By the end of the year, there will be 200 functions available," he claimed.

Each Optionware module costs $300 from DSS Development, located at Corporate Place, 4 Barnard Lane, Bloomfield, Conn. 06002.

CORONA from page 117

er for personal computers at Docutel Olivetti. Christianson estimated that Docutel Olivetti has sold 5,000 Corona IBM-compatible computers since the OEM agreement last November.

Corona plans initial PPCXT shipments this month.

MICROCOMPUTERS

Continued from page 130

sizes for explanatory text and the use of footnotes.

Fast Graphs can be used with data from Visicorp's Visicalc; Microsoft, Inc.'s Multiplan; Lotus Development Corp.'s Lotus 1-2-3; Sorcim Corp.'s Supercalc; or Innovative Software's Fast Facts and TIM IV. It is available for the IBM Personal Computer and compatibles, running under PC-DOS with two disk drives or hard disk, 128K bytes of random-access memory, a graphics interface card or monochrome card and monochrome monitor. Version 2.0 costs $350.

Innovative Software, No. 380, 9300 W. 110th St., Overland Park, Kan. 66210.

GENERAL ELECTRIC INFORMATION SERVICES CO.
Merlin application software

The General Electric Information Services Co. has announced that it will market over 40 microcomputer-based banking applications programs from Micro-Sharing, a new division of Merlin Information Systems, Inc.

The software will be sold on a subscription basis to large, regional banks, which will in turn remarket the software on a monthly subscription basis to smaller banks, according to the vendor. The arrangement would permit smaller banks to use the Merlin Information Systems banking software without paying the usual purchase price of more than $30,000 for the product.

The software will be downloaded to subscribing regional banks via the GE Mark III teleprocessing network and will run on IBM Personal Computers and Personal Computer-compatible machines.

Subscriptions are priced at $250 per month, with a minimum order of 20 per institution required.

GE Information Services, 401 N. Washington St., Rockville, Md. 20850.

DATANEX, INC.
Barr/Hasp

Datanex, Inc. has introduced Barr/Hasp, a communications package for the IBM Personal Computer.

The product, oriented to high-speed, bulk transfer of data, has remote job entry (RJE) capabilities. Barr/Hasp can move periodic transaction batches, RJE jobs, programs, messages, object files and executable files. An unattended mode allows the IBM micro to pick up or deliver information to a remote computer. Barr/Hasp costs $890 and includes a synchronous interface board.

Datanex, P.O. Box 1728, Eugene, Ore. 97440.

SOLUTIONS BY EXAMPLE, INC.
PC Speak enhancements

Solutions by Example, Inc. has enhanced PC Speak, a software package that allows blind users to work with the IBM Personal Computer.

The software works with a text-to-speech synthesizer. PC Speak will verbalize all data on a screen, or the user can select words or lines with a cursor. The software can be used with programming languages such as Basic or Pascal and software packages such as Lotus Development Corp.'s Lotus 1-2-3.

PC Speak runs under Microsoft Inc.'s MS-DOS and needs 64K bytes of random-access memory, a parallel or serial adapter and a text-to-speech synthesizer.

PC Speak costs $395.

Solutions by Example, Box 307, New Town Branch, Boston, Mass. 02258

ADVANCED DATA INSTITUTE, INC.
Genie

Advanced Data Institute, Inc. (ADI) has introduced Genie, a set of routines that allow programmers to develop applications that use ADI's Aladin data base.

Genie features initialization and holding of data base access paths, reading, updating and deleting of records and full or partial searches with wild cards, the vendor said. The utility reads or displays full or partial records, is menu-driven and includes data base interface operations and utility procedures, ADI said.

Genie costs $500 and works with Microsoft, Inc.'s MS-DOS or Softech Microsystems, Inc.'s P-system.

ADI, 1215 Howe Ave., Sacramento, Calif. 95285

APPLIED MICROSYSTEMS, INC.
PC-Profs Version 1.2

Applied Microsystems, Inc. has introduced PC-Profs Version 1.2, an IBM Personal Computer-based interface to the IBM mainframe Professional Office System (Profs).

The new system includes support of both the color graphics adapter and the monochrome monitor adapter and the ability to import and export Personal Computer text files into Profs notes and documents. All users of older versions of PC-Profs will be upgraded at no charge.

According to the vendor, PC-Profs provides an electronic office for user interaction. Pictures are selected on the screen to perform actions analogous to conventional office fixtures such as in/out trays, a file cabinet, a waste basket and a pad of paper.

The program requires 256K bytes of random-access memory and runs under VM with the mainframe and PC-DOS 1.0, 2.0 or 2.1 for the Personal Computer.

The product is available for $295 per copy. A demonstration diskette sells for $10.

Applied Microsystems, P.O. Box 832, Roswell, Ga. 30077.

LIFEBOAT ASSOCIATES, INC.
Enhanced version of Lattice C

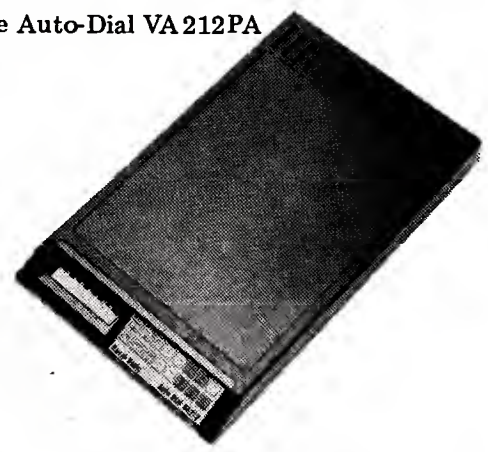
Lifeboat Associates, Inc. has enhanced its Lattice C compiler to support Microsoft, Inc.'s MS-DOS 2.0 operating system.

The enhanced version enables pro-

Continued on page 132



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Continued from page 131

grams to use MS-DOS' tree-structured directory to organize large numbers of files and provide file access to other directories, the vendor said. The compiler allows users to address 1M byte of storage with an Intel Corp. 8088 or 8086 microprocessor. Lattice C costs $500.

Lifeboat Associates, Dept. C, 1651 Third Ave., New York, N.Y. 10028.

MOTOROLA, INC.
System V/68

Motorola, Inc. has announced System V/68, a version of AT&T's Unix System Five operating system for Motorola's 68000 microprocessors.

System V/68 is the first Unix port that AT&T has developed jointly with an outside source, according to Motorola. Motorola plans to provide source code updates, maintenance and support of the operating system.

Source and object codes are available for $2,000 each, plus media charges.

Motorola, P.O. Box 20912, Phoenix, Ariz. 85036.

DATAVIZ, INC.
Oneshot

Dataviz, Inc. has introduced Oneshot, a productivity tool enhancer.

Oneshot takes data from mainframes, public access systems, other microcomputers and time-sharing systems and transfers it to an IBM Personal Computer or compatible machine. The data can be in the form of reports, queries, data files or any information arriving via communications products, Dataviz said.

Oneshot learns how to read/interpret data and recognizes headers, footers, separators, subtotals and other nondata, Dataviz said. It identifies data by the position of columns and format (text or numeric) and is priced under $200.

Dataviz, P.O. Box 1319, Norwalk, Conn. 06856.

CHAS-MOORE, INC.
XT-Driver

Chas-Moore, Inc. has introduced XT-Driver, a menu and security system that is designed for the IBM Personal Computer XT and IBM Personal Computer-compatible hard disk systems.

Users are assigned one password and a security code, Chas-Moore said. The information builds the user's menu and provides access to applications according to the user's security code level. The XT-Driver is said to provide menus containing popular applications and to allow users to build their own menus.

Other features include a log system for tracking user access, a programmable calculator, a directory manager, a message center and PC-DOS support menus that are said to aid users in the execution of certain commands, according to a spokesman for Chas-More.

The price of the basic menu and security system is $80, the spokesman said.

Chas-Moore, 3104 Jackie Center, Bakersfield, Calif. 93309.

PRENTICE-HALL, INC.
VCN Execuvision

Prentice-Hall, Inc. has introduced VCN Execuvision, a presentation graphics program for use with the IBM Personal Computer.

The product is menu-driven and makes it easy for novice computer users to make slides for presentation, according to the vendor.

The program was designed for use on the IBM Personal Computer with two disk drives, the IBM Color/Graphics Board and color monitor, Prentice-Hall said. VCN Execuvision is said to run under MS-DOS 1.1 and to require 128K bytes of memory.

Highlights of the program include a choice of 10 text fonts with rescaling and color options; foreground and background colors; "electronic scissors"; run-time options; speed variations for animation/motion techniques; and a variety of hard-copy printing styles, the firm said.

The program sells for $395.

Prentice-Hall, 200 Old Tappan Road, Old Tappan, N.J. 07675.

LOGSYS, INC.
Business Modeller

Logsys, Inc. has announced Business Modeller, an electronic spreadsheet that runs on Digital Equipment Corp.'s VAX-11 series superminicomputers, PDP-11 series minicomputers and the Professional 300 series microcomputers.

Users can track payrolls, sales bonuses, loan repayments, key account purchases and research data, according to the vendor. Features include maximum and minimum average of a list, sum and count of list items, table lookup and choice and logic expressions.

Prices range from $650 to $2,500, depending on the installation.

Logsys, Suite 1408, 116 John St., New York, N.Y. 10038.

ANALYSIS TECHNOLOGY, INC.
Data Analyst

Analysis Technology, Inc. has announced Data Analyst, a software encryption service for market research and survey companies using IBM Personal Computers.

Data Analyst encrypts floppy disks so that users can manipulate statistical data but not access personal information, the vendor said. Data Analyst consists of a software package that allows the user to define which fields should be protected and a service which encrypts diskettes mailed to the company, according to the vendor.

Diskettes are returned within 48 hours, the vendor said.

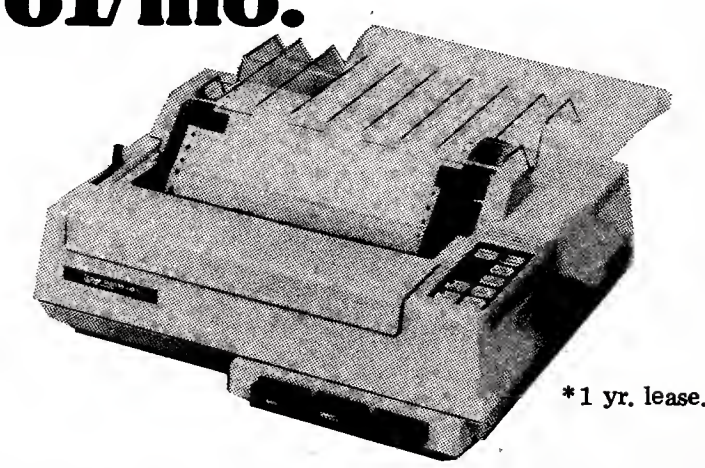
The software package costs $5,000. Each encoded diskette costs $75, Analysis said.

Analysis Technology, Suite F.P.O., Box 1070, 934 Pearl St., Boulder, Colo. 80306.

APPLIED SOFTWARE TECHNOLOGY, INC.
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MICROCOMPUTERS

management system for Digital Equipment Corp.'s Rainbow microcomputers.

Versaform allows the user to design form-oriented records and includes data entry checking and automatic calculation capabilities, the vendor said. Preprinted forms may be filed from screen data with stored instructions, according to the vendor.

Versaform requires 256K bytes of random-access memory and costs $389.

Applied Software Technology, 170 Knowles Drive, Los Gatos, Calif. 95030.

MICROCOMPUTER SPECIALIST, INC.
Ontime Calendar Manager

Microcomputer Specialist, Inc. has introduced Ontime Calendar Manager, a calendar management and appointment scheduling package for the IBM Personal Computer.

Users can view calendars, print schedules, search for available times, enter activities, maintain facility log books, schedule activities for groups, create tickler files and leave messages for co-workers, according to the vendor. Ontime Calendar Manager integrates with Information Unlimited Software, Inc.'s Easybusiness software series, the vendor said.

The product runs under IBM PC-DOS or Microsoft, Inc.'s MS-DOS, according to Microcomputer Specialist.

Ontime Calendar Manager costs $199.

Microcomputer Specialist, 18 Lyman St., Westboro, Mass. 01591.

GUARDIAN AUTOMATED SYSTEMS, INC.
Legal Office Software

Guardian Automated Systems, Inc. has introduced a Legal Office Software package made up of four modules all written in C language for Unix-based operating systems.

The Legal Accounting module reportedly permits time and billing record keeping, trust accounting and accounts payable recording, Guardian said. The Case Management and the Scheduler modules, respectively, track litigation and automate the office's calendar, according to the vendor. The Unicorn/DB module reportedly is a data base management program for customized reporting.

The four modules run on the Fortune Systems Corp. Fortune 32/16 computer. They are priced as follows: Legal Acounting, $2,500; Case Management, $2,000; Scheduler, $150; and Unicorn/DB, $295.

Guardian Automated Systems, Suite 600, Liberty Bank Building, 420 Main St., Buffalo, N.Y. 14202.

INDEX TECHNOLOGY CORP.
Excelerator

Index Technology Corp. has announced a package designed to assist systems analysts in design, organization and documentation.

The Excelerator package is an integrated, menu-driven system that combines graphics, data dictionary and word processing capabilities for the IBM Personal Computer XT, according to the vendor.

Users can utilize Excelerator's document preparation facility to produce specification documents for review, Index said. The package's Excelerator Dictionary is said to store all objects, connections, text, data elements and records to assure consistency and accuracy in design. Up to 10 levels of graphs can be linked together in the dictionary for explosion and sequencing diagrams.

Prices for Excelerator begin at $9,500, which includes the software on 5¼-in. diskettes, documentation, keyboard template, 128K-byte memory expansion board, graphics board and Microsoft, Inc.'s Mouse and Word packages.

Index Technology, Five Cambridge Center, Cambridge, Mass. 02142.

LANGUAGE PROCESSORS, INC.
LPI-Cobol; LPI-RPG-II; LPI-Pascal; LPI-C; LPI-PL/I; LPI-Basic

Language Processors, Inc. (LPI) has announced a line of high-level language compilers that reportedly allow users to mix subprograms written in different languages into a single program.

The compilers — LPI-Cobol, LPI-RPG-II, LPI-Pascal, LPI-C, LPI-PL/I and LPI-Basic — are designed for computer manufacturers whose systems use the Motorola, Inc. MC68000 microprocessor and the Unix operating system, a vendor spokesman said. The Cobol, RPG-II, Pascal and C compilers are immediately available, according to Language Processors. The PL/I compiler reportedly will be available mid-1984, the Basic compiler in late 1984.

The compilers are priced at $50,000 each, according to the LPI spokesman.

LPI, 400-1 Totten Pond Road, Waltham, Mass. 02154.

AT&T from page 117

But whose personal computers? Is the giant firm planning to launch its own models?

"Of course they will, if they go into the office market, which we all think they will," said Everett Meserve, an analyst with Arthur D. Little, Inc. in Cambridge, Mass. "It's inevitable."

AT&T in 'a quandary'

The need for a personal computer product places AT&T in "a quandary, the same quandary that IBM has with endorsing Unix," Boyle commented. "They have to do it, but they'd like to postpone it as long as possible."

Robert Casale, president of marketing and sales for AT&T Information Systems, said last month's announcements "have no direct bearing on our agreements with Convergent Technologies, Inc." Casale later added that products from that deal are expected to ship this year.

AT&T and Convergent have released no details on those forthcoming products, but Convergent is widely expected by industry analysts to supply a version of its N-Gen workstation built around an Intel Corp. 80186 chip.

The Santa Clara, Calif.-based vendor began shipping N-Gens to other OEMs last year, but has acknowledged production delays.

Lower end micros to debut?

George Colony, president of Forrester Research, Inc. in Cambridge, Mass., predicted that AT&T also will introduce lower end microcomputers.

"These could be made by Japanese companies, Corona [Data Systems, Inc.], Eagle [Computer, Inc.] or Olivetti [Corp.]," Colony said. "I know AT&T has talked to all of these."

Of course, Colony admitted, AT&T has plenty of other potential suppliers for any machines it chooses to offer.



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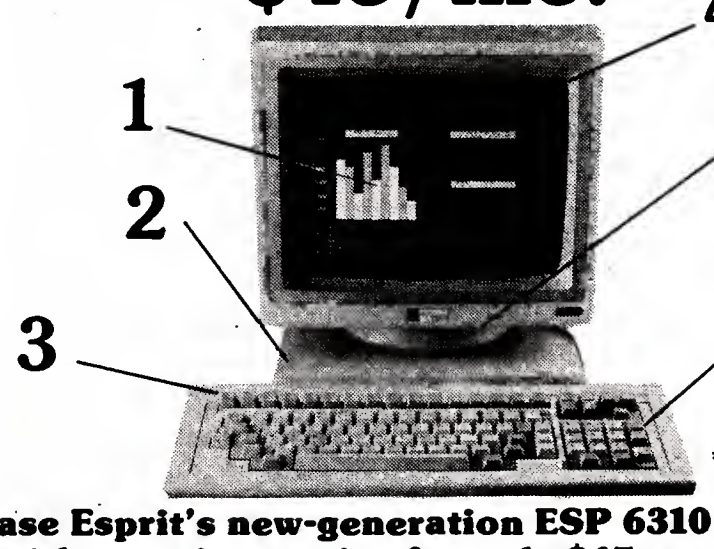
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MICRO BITS/THOMAS W. MADRON

Market still not geared toward organizations' different micro uses

Microcomputers have different uses in large and small organizations, and the market has not yet sorted itself out on the differing needs of the two kinds of organizations.

The most significant difference is that in large organizations micros are employed as personal productivity improvement tools for white-collar staff, while in small organizations the main objective is to meet the organization's operational goals. A person in a small business may also use a micro to improve personal productivity, but that may not be a sufficient reason for acquiring the machine.

In the late 1970s, micros were designed primarily for hobbyists and others interested in the micro qua micro. Very soon after it became clear that micros could be used for serious computing, machines and associated software were marketed to small businesses. By early 1982 it was becoming clear that the major market for micros in the mid-1980s would be large businesses, industries, government and education.

In small businesses, a microcomputer may be used for general data processing in the same way that a large organization would depend on its mainframe.

Hence, in the late 1970s the large microcomputer manufacturers almost always offered a general-purpose accounting package. But in a large organization, centralized business accounting will be run on a mainframe computer, and the micro probably will act as a terminal to that system.

With the newer 16-bit machines (which might be called the machines of the large corporations), software emphasis has been placed on word processing, spreadsheets and personal data management programs. The rationale behind this approach is that the micro in a large organization will be employed as a personal workstation rather than for general data processing.

Nowhere is the difference in uses of microcomputers more different for large and small organizations than in the need for communications.

Many applications in small businesses, for example, will probably not need to communicate with another computer. Indeed, there may be only one micro in-house. If communications are needed, the micro will often be used only occasionally, perhaps to contact a national information utility such as Dow Jones & Co.'s News/Retrieval Service or Source Telecomputing Corp.'s The Source.

But a large organization, which may buy hundreds or thousands of micros, will make a major mistake if its micros cannot communicate with its mainframe computer system.

As small blends into large, these scenarios may change, of course. If we have five or 10 micros in an office, in either a large or small organization, there may also be the need for a local-area network.

Local-area networks can support thousands of connections, but some are designed for smaller numbers of devices (up to 64 or 256, for example).

POS from page 117

checked, the form can be used several ways: as a sales ticket, a manager's key form, an inventory or a daily revenue report.

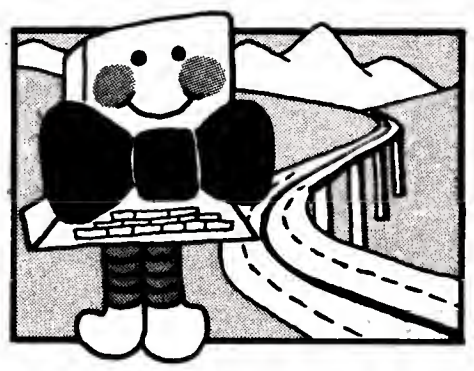
As the data is entered, the store's computer shows how it is reading the data via the Micropad's 40-character LED display screen. The screen also displays answers to the sales clerk's calculations on the form and flashes the name of each part being sold or ordered as its parts number is entered.

Should an error or misinterpreted symbol be displayed, the clerk can immediately correct it on the form, a feature that Welsh said has caused the accuracy of sales data to rise considerably.

Once the transaction is completed, the data is stored on a diskette, and managers can at any time access their store's system to gain up-to-the-minute sales information, such as total sales for the day and month, including commissions, for each of their sales clerks.

The sales clerks were given a half-hour training session on the Micropads. Although they must be careful about printing neatly — a slanted 1 can easily become a slash sign — the clerks are able to complete the forms in less time than when they were working without Micropads, Welsh said.

Advertise in the largest computer market in Europe—Germany—and reach well over 155,000 people.



The German computer market is the largest in Europe and the third largest in the world. It has over $11 billion in installed general purpose computers. The fastest growing segment of the German computer market is the microcomputer, with an installed value of $283 million. There were 10,000 IBM PC's sold in 1983 and another 30,000 units including IBM PCjr's are expected to be installed by the end of 1984.

You can reach the DP/MIS market, the PC market, the microcomputer market or the computer retailing market with our four German publications; *Computerwoche*, *PC Welt*, *Microcomputerwelt* and *Computer Business*.

Computerwoche is Computerworld's sister publication for the German EDP/MIS market. With a circulation of 30,000, *Computerwoche* reaches the important decision makers in medium to large computer-using organizations throughout the country.

We cover the microcomputer market with our microcomputer publication — *MicroComputerwelt*. Every month, *MicroComputerwelt* circulates to 65,000 German microcomputer professionals in the business, science and education fields.

PC Welt is our monthly publication specifically designed for IBM PC users. *PC Welt*'s total distribution is 50,000 and it is being sold at newsstands throughout Germany.

Computer Business, modeled after MICRO MARKETWORLD in the United States, covers all channels of distribution in the computer industry. *Computer Business*, circulates to 10,000 key decision makers with bulk-buying responsibility.

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COMPUTER INDUSTRY

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

AT&T's shot at DP may end up a dud

AT&T fired off its shot heard round the world, but there remain many doubts about whether the communications giant can revolutionize the information processing industry.

Declining, at least temporarily, to enter the mainframe business, AT&T appears to have hitched its star to the success of its own Unix operating system.

Unix, it would seem, is the only product with the potential for bringing AT&T's hardware lineup to a position of dominance in the market.

To some people, the micro-to-supermini batting order unveiled recently by AT&T appears in many respects to be designed to battle with Digital Equipment Corp.'s cadre of machines. But DEC has a 10-year head start.

AT&T said its equipment will be available initially through value-added remarketers and to large-scale users who have the capabilities, time and resources to develop their own application packages. This, indeed, was the manner in which DEC cemented its market share; but, again, DEC has had several years during which third parties developed software that is now readily available.

Therefore, the key to hardware success for AT&T has to rest in the success of Unix. Unix in various releases has been available for years and has won a following in the academic market, and, reportedly, there are some 300 applications now available for Unix operating systems.

But while the operating system has generated much excitement in the computing community in recent months, the jury is still out as to whether it has the functionality and ease of use to stave off

See **UNIX** page 156

Used computers seen safe bets

Big Blue security blanket covers buyers' risks

By F. Peter Model
Special to CW‡

First in a two-part series

Many businessmen avoid the used computer market because they suspect it's like the used car racket. They couldn't be more off base.

The used car market isn't dominated by one company; the used computer market is. No car maker would dream of providing open-ended maintenance to second-generation owners; IBM does.

Without that Big Blue security blanket, there wouldn't — couldn't — be a used computer market. An overwhelming 97% of the $7 billion business written by the 225 member firms of the Computer Dealers and Lessors Association (CDLA) is for IBM equipment.

Not only is there more IBM equipment than anything else, but IBM alone provides "cradle to grave" protection: As long as one of its computers performs according to published specs, IBM will maintain it.

Today, "fixing up" a computer is almost entirely cosmetic. Malfunctioning chips are replaced in seconds; circuit boards in minutes. Nor does internal machinery wear out because the computer's lower power generates little destructive heat, and most computers exist in climate-controlled environments.

The CDLA — comprised of third-party lessors, dealers and brokers — all of whom traffic in both new and used equipment — is aware of how many businessmen feel about entering the secondary market. Under Executive Director James F. Benton, it is starting to wage a low-key image campaign that stresses that the aftermarket is no different from the over-the-counter stock market.

Svend E. Hartmann, a New York dealer who also publishes one of the industry's price guides, said the aftermarket is a "risky business," but its members are "intrinsically decent fellows."

Dealers who can't depend on IBM's maintenance security blanket — remarketers specializing in Digital Equipment Corp., Data General Corp. and other makes

See **MART** page 156

Booming demand for semi parts causing headaches for small manufacturers

By Robert Batt
CW West Coast Bureau

MENLO PARK, Calif. — The booming demand for semiconductor components is causing massive headaches for many of the nation's medium and small computer manufacturers.

With chip manufacturers such as Intel Corp., Motorola Semiconductor Products, Inc. and National Semiconductor Corp. sold out completely on many of their products through 1984, even industry giants such as IBM reportedly are not able to get all the components they need.

At Convergent Technologies, Inc. of Santa Clara, Calif., production of the new N-Gen workstation has been hit by the shortage of Intel's latest 80186 chip, according to Nathan Teichholtz, director of marketing. Because of this, N-Gen is reputed to be six months behind schedule.

N-Gen proving critical factor

The N-Gen system is a critical factor in Convergent's drive to replace its older line of desktop computer products, and so any delays can be serious for a company already suffering from a decline in earnings.

"The effect of the delays is that many of our larger customers who were winding down their previous generation of products in anticipation of new models from us are now going to have to wait longer than we would wish," Teichholtz said.

Chips in heavy demand include Intel's standard 8086 product and the 8048/8051 line of microcontroller chips; 64K-byte dynamic random-access memory (RAM) systems; transistor-to-transistor logic chips;

See **SEMI** page 152

MAGNUSON COMPUTER SYSTEMS

Magnuson Computer Systems, Inc. files its reorganization plan one year after declaring itself bankrupt, and a Storage Technology Corp. subsidiary will acquire Magnuson's assets if the bankruptcy court agrees/**138**

INSIDE

■ U.S. Sen. Paul Tsongas (D-Mass.) blasts the Reagan administration's policies on regulation of U.S. high-tech exports/**139**

■ IBM's UK subsidiary caused a stir when it informed dealers the U.S. has to OK the transfer of U.S.-made computer equipment, even when it's staying within UK borders/**141**

■ General Electric Information Services Co. and McDonnell Douglas Automation Co. are vying for a contract to establish an electronic funds transfer system for banks nationwide to transfer institutional funds/**142**

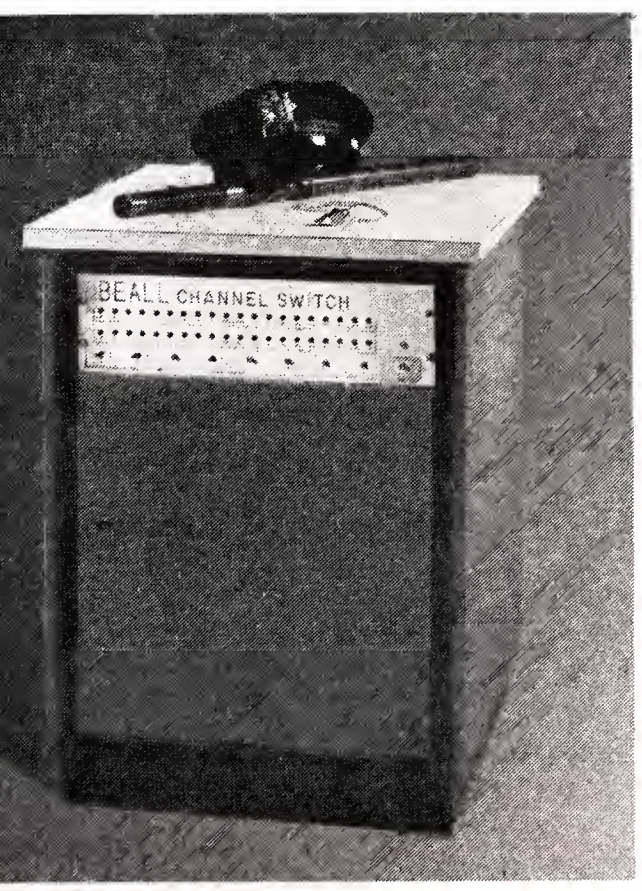
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COMPUTER INDUSTRY

Magnuson files proposed plan of reorganization

SAN JOSE, Calif. — A little more than one year after filing for protection under Chapter 11 of the Federal Bankruptcy Act, Magnuson Computer Systems, Inc. recently filed a proposed plan of reorganization that would result in its assets being acquired by a subsidiary of Storage Technology Corp.

Under the proposed reorganization plan filed in Federal Bankruptcy Court here March 30, all assets other than approximately $2.2 million in cash will be acquired by Global-Ultimacc Systems, Inc., a private company formed in February and a 66%-owned subsidiary of Storage Technology.

Magnuson, a manufacturer of IBM 4300-compatible computers, declared itself bankrupt early last year [CW, March 14, 1983], blaming its woes partly on steep price cuts made by IBM for the 4300.

The reorganization plan calls for payment to general creditors of a total of slightly less than $1 million cash in settlement for all unsecured claims allowed by the bankruptcy court; holders of unsecured claims will have the option of receiving 50% of allowed claims or $500, whichever is less. The reorganization would also cancel all outstanding shares of Magnuson stock.

All of Magnuson's assets in excess of approximately $2.2 million cash for unsecured creditor claims and priority payments (such as payroll and taxes) would be acquired by Global-Ultimacc in exchange for shares of its stock. All of the Global-Ultimacc shares received in that transaction would be distributed to the private investor group, which holds substantially all of Magnuson's secured debt and a majority of its equity securities.

If the recently filed proposed disclosure statement is approved by the court, the plan will be submitted to creditors for their approval in approximately 30 days.

Market analysts attributed the slow demise of Magnuson over the last three years to a combination of factors. Those factors included both management shortcomings and intense competition in the IBM marketplace.

The company's search for a possible merger or acquisition partner began in 1982 as the computer manufacturer's assets continued to decline.

During the two years prior to seeking refuge in Chapter 11, Magnuson had lost approximately $57 million dollars.



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Conference for resellers set for May

WASHINGTON, D.C. — Telestrategies, Inc. will hold a conference and exhibition here May 21-23 on "Value-Added Resale: Survival Strategies for 1984 and Beyond."

The conference will address how resellers can enhance their chances for success by implementing survival strategies to diversify the business. The exhibition will showcase telecommunications technology and service alternatives such as customer billing, electronic mail and voice store-and-forward services.

The registration fee is $1,095 for the three-day program. More information is available from Telestrategies at Suite 102, 6842 Elm St., McLean, Va. 22101.



COMPUTER INDUSTRY

Tsongas: Tight export controls will harm U.S. high-tech trade

By David Olmos
CW Staff

BOSTON — U.S. Sen. Paul Tsongas (D-Mass.) recently criticized the Reagan administration's efforts to tighten export controls for high-technology companies, saying such restrictions will seriously damage the nation's ability to compete in the international marketplace.

Tsongas predicted that the free trade argument being sounded by the high-tech industry and others will eventually prevail in the U.S. Congress over the administration's concerns about national security.

The senator's remarks came at the Symposium on the Transfer of Technology in the International Marketplace, a two-day conference here sponsored by the Federal Bar Association. Tsongas is a member of the Senate Foreign Relations Committee, Small Business Committee and Natural Resources Committee.

Tsongas warned that the U.S. is experiencing a rapid decline in its competitive trade posture. "If we don't begin to view high technology as the kind of steel and auto industries of the future and address them the way [those industries] should have been addressed back in the '60s, then states like mine, which are now high-technology-dependent, will know the kind of decline we knew when I was growing up."

Tsongas questioned the administration's contention that tougher export controls are necessary to help halt the illegal flow to the Soviet Union of U.S. technology, some of which could be used for military purposes. He noted that the administration's main arguments for favoring export restrictions involve defense-related concerns.

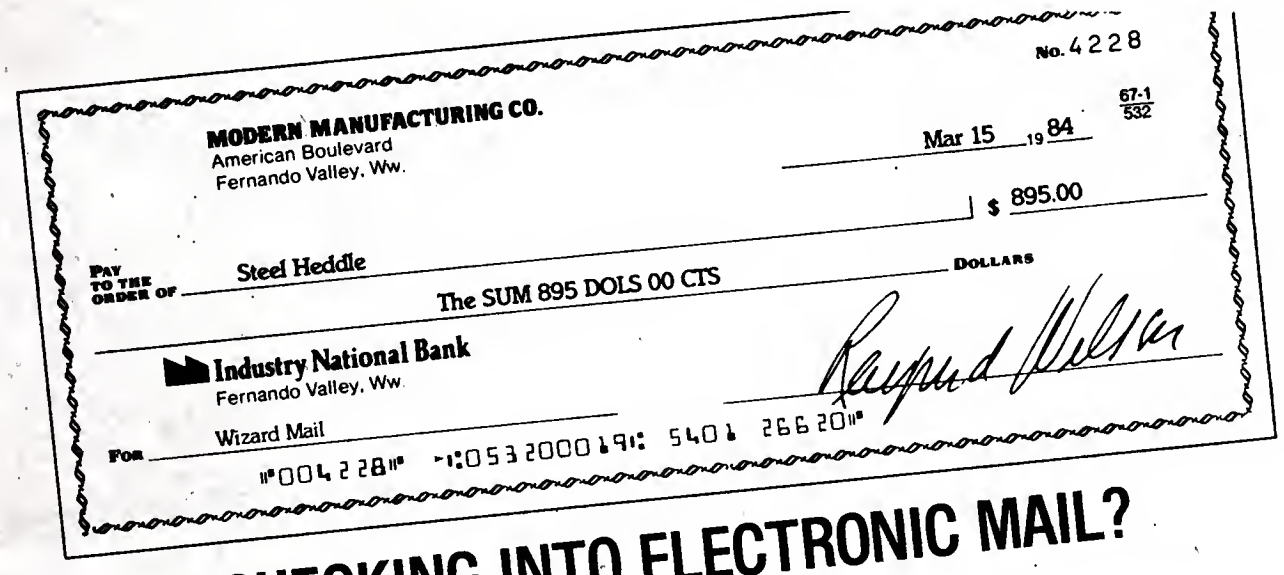
He said it is interesting that the administration can argue, on the one hand, that the Soviets have achieved military superiority over the U.S. and claim, on the other hand, that access to U.S. technology will allow the Soviets to catch up militarily.

Tsongas contended, as have computer manufacturers, that many high-tech goods restricted by the U.S. are readily available elsewhere in the world. "It seems to me the U.S. is going to have to decide once and for all whether it wants to be a serious international competitor," he said.

The senator said he is pleased with the House version of the Export Administration Act and does not expect sharp differences between the House and Senate bills. He added, however, that the bill could fall prey to administration pressures or be lost in the shuffle of this election year.

Tsongas urged high-tech company officials to let Washington, D.C., legislators know about their concerns over export controls. "There's no constituency pushing for rationality. All the constituencies we hear from are basically those spooked by the Soviets."

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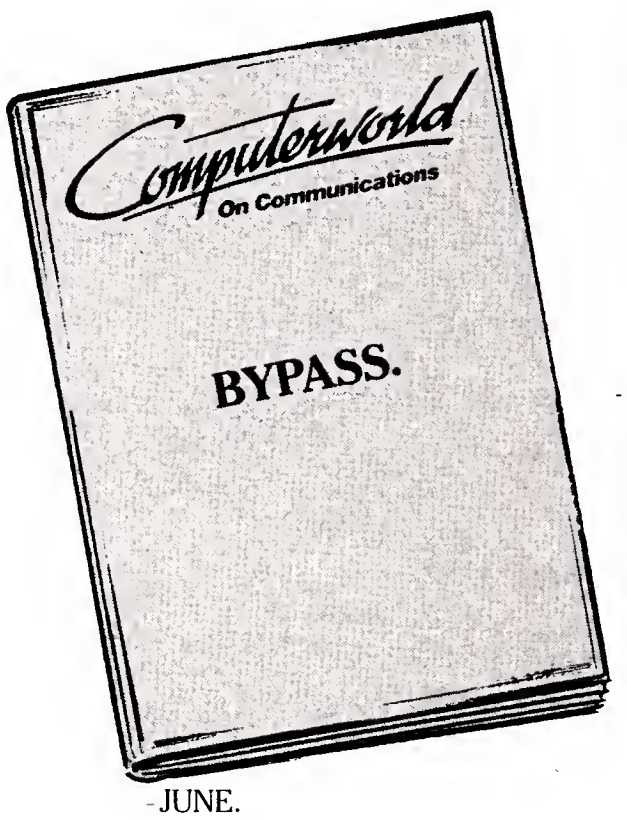
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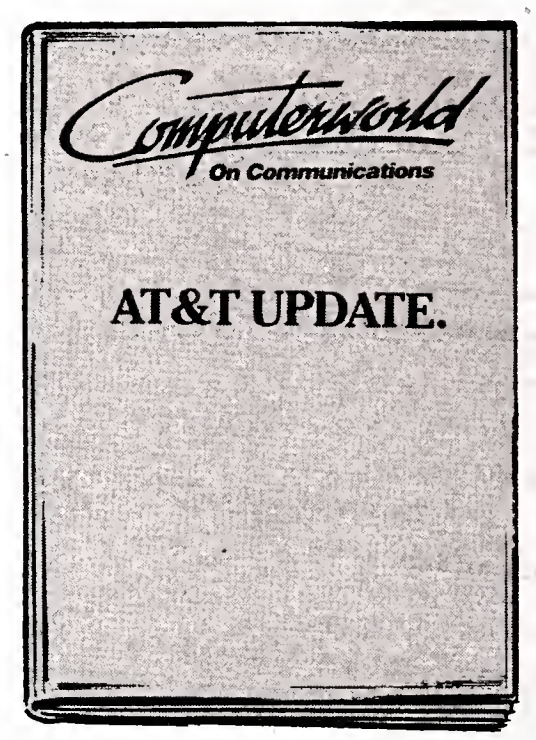
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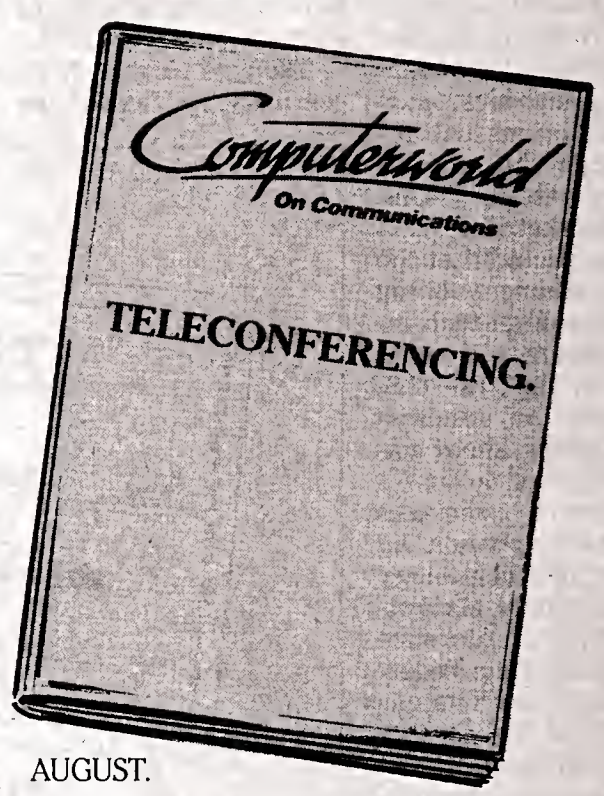
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Bypass. Bypassing the local loops provided by the Bell Operating Companies has become rampant with the availability of alternative technologies. See what this means to both big, regional operating conglomerates and smaller, non-Bell Operating Companies—all in the June issue.
Closes May 4.



JULY.

AT&T update.
Who are the winners and who are the losers after more than six months of deregulation?
Closes June 1.



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Directive to IBM's UK lessors seen as U.S. interference

By Rex Malik
Special to CW‡

LONDON — Leasing companies and their customers holding U.S.-made computer equipment must obtain the approval of U.S. officials before they can transfer that equipment to others within this country, IBM United Kingdom, Ltd. informed customers recently in a letter that has been interpreted as an attempt by the U.S. government to enforce its own rules in other countries.

The letter went on to remind IBM customers here, "As you are aware, transactions within the United Kingdom involving 'advanced systems' are also subject to the obtaining of U.S. export license approval. Such transactions include not only the initial installation of a new machine with a user, but also any subsequent dealings or transfers in such machines (at least while they remain an 'advanced system')."

Sent to the 30 major UK leasing companies dealing in IBM systems, the letter included as advanced systems: the 3033, 3042, 3062, 3081, 3083 and 3084, the 3838 and the 4381 Model Group 2.

The letter went on to say that transfers between users of any machines listed would require prior U.S. Commerce Department export licensing and that applications could take three months to be processed.

Norman Tebbit, secretary of state for Trade & Industry, declared, "That is quite clearly an attempt by the U.S. government to impose its laws within the United Kingdom."

There is a belief within the UK leasing industry that the issue has come up at this time in part because the U.S. Export Administration Act is up for renewal, and there are considerable pressures in Washington, D.C., to make the rules stronger.

The list that IBM uses in the letter includes the 3033, which is now technologically obsolete. Whether or not they have ended up in the Eastern bloc, a number of such systems, and others on the list, are said to have been resold here without any notification.

Mike Dudley, a senior executive with Capital Leasing, said, "Once we have sold a system to a user, we cannot impose conditions and police them on its resale." He believes that few of the leasing industry's — or IBM's — customers in the UK bother about these so-called procedures or resale. He points out, however, that any exports would be covered by UK legislation, and applications would have to be made to the British government. The IBM letter noted all such exports "are also licensable" by a UK government agency.

Parry Mitchel, chairman of United Leasing, one of the larger UK leasing companies, said IBM would not issue such a letter without the prompting of Washington and called it "an attempt by the U.S. government to impose its laws within the United Kingdom. And that, of course, is contrary to international law."

Mitchel issued some pointed guidance to IBM UK, saying, "Unless this problem is resolved ... it's going to be extremely bad for their business."

Fake Apples barred from U.S.

WASHINGTON, D.C. — The International Trade Commission (ITC) recently barred the import of Apple Computer, Inc. Apple II and Apple IIe look-alikes, whether or not they contain an internal operating system, unless importers post a 200% duty tax on the value of the product.

President Reagan now has 60 days to accept or reject the findings of the commission.

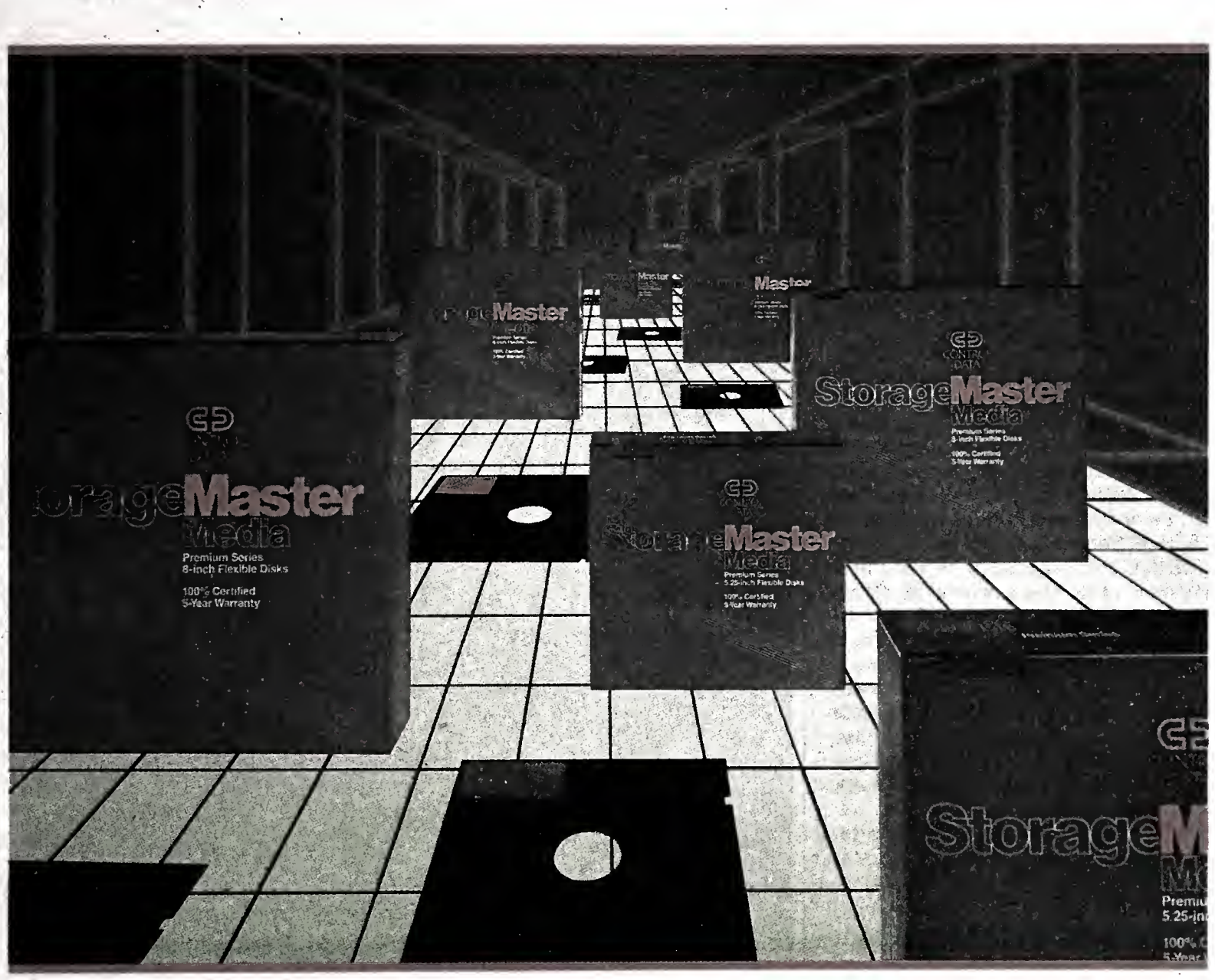
"We concur that the infringing imports have a tendency to substantially injure the domestic [computer] industry," the report said. "It is clear from the record that numerous [parties] are attempting to sell, and are selling, infringing computers in the U.S. under circumstances that indicate they are likely to be successful."

The ITC also noted that the Apple look-alikes are selling at prices much lower than Apple products, ranging from $300 to $400 per unit. U.S. Customs Service officials report that they have seized about 3,000 computers being sold as Apples.

The ITC determined that both Apple patents and software copyrights were being violated by the imports. The commission went further than expected when it expanded the order to bar imports "that have motherboards substantially similar to the Apple motherboards.

"To avoid evasion of our order, it excludes from entry computers and components [without read-only memory] which can be shown to be associated with imports," the ITC said.

Apple originally filed a complaint charging at least 15 foreign-based concerns, most of them located in Taiwan and Hong Kong, with manufacturing Apple look-alikes. Only two parties named by Apple appeared at the investigative hearing conducted by the ITC.



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CONTROL DATA

Nacha narrows EFT search to Geisco, McAuto

By David Olmos
CW Staff

WASHINGTON, D.C. — A National Automated Clearing House Association (Nacha) task force has narrowed its search for a private processor of institutional electronic funds transfers (EFT) to two vendors — General Electric Information Services Co. (Geisco) and McDonnell Douglas Automation Co. (McAuto).

The task force is investigating how the nation's 31 regional automated clearing houses might switch from the Federal Reserve System to a private processor for financial institution payments.

The regional associations supervise the processing of corporate and consumer electronic fund transactions, which are sent through member banks and participating companies.

These transactions typically include preauthorized payments, such as automatic payroll deposits; interest, dividends, pensions and annuity payments; and payments of mortgages, installment loans, insurance premiums and utility bills.

The selection of Geisco and McAuto completed the first phase of Nacha's evaluation of proposals from eight companies, including IBM, Mastercard International, NCR Corp. and Visa U.S.A., Inc. A second phase of the selection process involves evaluating the Geisco and McAuto plans and deciding how they fit in with Nacha's overall objectives, according to Merrill Miller, Nacha vice-president and senior vice-president of California First Bank in San Diego.

Miller said the task force could recommend to the automated clearinghouses either a regional or national approach. Under a regional plan, it would be up to the individual associations to decide whether to replace the Federal Reserve with a private vendor. Automated clearinghouse groups in Arizona, Hawaii and New York have already taken such a step, Miller said.

A second approach would be to develop a single private vendor to provide EFT for the regional associations.

In seeking an alternative to the Federal Reserve, Nacha hopes to point the way toward lower costs and better service for the automated clearinghouses, according to Gary Singer, secretary/treasurer for Nacha. He said the group is particularly interested in moving toward an all-electronic delivery service, something the Federal Reserve is presently unable to provide. "We're trying to provide a flexible and efficient automated clearinghouse environment," he added.

"There is one national processor [the Fed] now," Miller said. "If you look at any other aspect of banking [such as check clearing], there are many service providers." A more competitive environment, he added, "is very healthful in terms of refining, developing and enhancing the service."

The Geisco and McAuto plans were outlined in March at the annual Nacha conference in New Orleans. Geisco proposed a nationwide automated clearinghouse service that would use its existing Mark 3000 IBM-based processing service and its Mark III network, company officials said.

McAuto also is proposing a national electronic payment delivery system called the Financial Users Nationwide Distribution and Settlement. The McAuto bid, part of a joint effort with the First National Bank of Chicago, is said to feature full electronic transfer and the capability to service both small and large financial institutions, a company spokesman said.

Both vendors agree that the Nacha recommendation is potentially very lucrative.

The task force will meet this month to evaluate further the two vendors' offers. The group hopes to make a recommendation by the end of June, Singer said.

Intel to build plant in Ariz.

SANTA CLARA, Calif. — Intel Corp. announced recently it will build its first major semiconductor component and assembly plant in the U.S. in Chandler, Ariz.

Construction of the 200,000-sq-ft plant will begin this year, and the facility will open in the second half of 1985, the company said.

Intel's other major assembly plants are located in Malaysia, the Philippines and Barbados.

The company also announced recently it will build its ninth wafer fabrication plant in Rio Rancho, N.M.

Gordon E. Moore, chairman and chief executive officer of Intel, said the Chandler plant will be a cost-effective component assembly plant "because the assembly process is becoming increasingly automated and, therefore, less labor intensive."

Intel said it expects to spend more than $300 million on new facilities and equipment this year.



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STC to remain silent on lawsuits, seek single hearing

By Peter Bartolik
CW Staff

SAN FRANCISCO — Storage Technology Corp. (STC) said recently it will not comment outside the courtroom on the mounting lawsuits filed by investors in its canceled mainframe project, but an attorney who filed one of the suits said STC will seek to have all the suits heard by one federal judge here.

Ronald B. Weinel, STC vice-president for investor relations, said recently the company will "just go on through the normal course of litigation, and we will just not make any public comment on them."

A total of six suits claiming misrepresentation and fraud by STC have reportedly been filed in various federal jurisdictions, although STC would not definitely confirm that. Weinel said he couldn't be sure of the exact number.

According to Chicago attorney Donald E. Egan, who filed the first suit [CW, Feb. 13], a class action suit brought by investor Michael Abelson, six suits are definitely pending in federal courts in San Francisco, Denver and Tampa, Fla.

The suits have been filed on behalf of Class A and Class B investors in Storage Technology Partners, a limited partnership through which STC raised in excess of $60 million to fund development of an IBM-compatible mainframe computer, which it subsequently canceled earlier this year [CW, Feb. 6]. All the suits reportedly charge to some degree that STC misrepresented the success it was having in developing the mainframe.

According to the suit filed by Egan, the partnership sold 5,000 units at $10,000 per share to 300 Class A investors for a total of $50 million between 1981 and 1983. In mid-1983, the partnership offered 2,000 units of Class B shares at $10,000 per share, and 180 investors paid approximately $10.6 million.

Egan said he is aware of — in addition to the class action suit filed by him regarding Class B investors — two individual suits filed by Class A investors in Denver, a class action suit for Class B investors filed in Tampa, an individual suit for Class A investors filed in San Francisco and, the most recent, a class action suit for Class A investors filed in San Francisco.

Egan said it is his understanding STC will file motions to bring all the cases under the jurisdiction of one judge in federal court in San Francisco. STC has not yet filed any answering brief to the charges, and "we've agreed to give them additional time," Egan said.

Commenting on his request that treble damages be awarded investors under terms of the federal Racketeer-Influenced and Corrupt Organizations Act (Rico), Egan said use of Rico is becoming "a very popular and vocal tool" in civil suits, although it was originally designed for use against organized crime figures.

Honeywell sets pact with NEC

MINNEAPOLIS — Honeywell, Inc. and NEC Corp. recently concluded definitive proceedings formalizing an agreement reached in principle last year to combine Honeywell's operating system with NEC's S1000 hardware system. It was also announced that CII-Honeywell Bull of France has signed a similar agreement in principle with NEC.

Honeywell and NEC announced last October [CW, Oct. 31] the decision to realign their business strategies. NEC essentially grew under Honeywell's wing and was granted Japanese rights to Honeywell technology in 1962, but the relationship began to erode in 1980.

Early last year [CW, Feb. 14, 1983] it appeared the two vendors were competing against each other when General Electric Information Services Co. (Geisco) announced that its network of Honeywell DPS 8 computers would be upgraded with NEC's S1000 mainframe, rather than with Honeywell's announced DPS 88/81 machine.

Still in contention

Kathy Tunnheim, spokeswoman for Honeywell, said Geisco has not yet announced final results of its "runoff" and that Honeywell remains in contention. Contrary to reports, she added, either vendor's machines selected by Geisco will run under Geisco's own Mark III operating system.

Honeywell said it would not dispute overseas reports that NEC will supply 150 of the S1000 machines to Honeywell.

Honeywell said the agreements provide for the three companies to work together to integrate NEC's S1000 large-scale processor with Honeywell's Gcos operating software, peripherals and communications system.

The S1000 system will be available to Honeywell late in 1985 and to CII-Honeywell Bull in 1986, Tunnheim said.



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The Bull Group to establish Bull Peripheral in Calif.

To spark developmental capability for Bull in U.S.

SUNNYVALE, Calif. — A subsidiary of CII-Honeywell Bull, Cynthia Peripheral Corp., announced recently The Bull Group will establish Bull Peripheral here to initiate a developmental capability for Bull in the U.S.

Bull Peripheral, composed of groups of senior technical staff from the France-based computer manufacturer, will concentrate on magnetic printers and rigid disk drives and will plan and develop leading-edge products for downstream marketing in the U.S. and Europe.

The French complement in the U.S. will number a half-dozen employees over the first year and will be housed in a new 10,000-sq-ft addition to the present Cynthia Peripheral located here.

Cynthia Peripheral said the new group will grow to a more comprehensive Bull presence in the U.S., leading to assembly and test operations. The Silicon Valley area reportedly was selected because of its reputation as one of the leading research and development areas in the world.

The Bull Group is said to be the leading French manufacturer of computers, with revenues last year of nearly $1.5 billion. Cynthia Peripheral is responsible for all Bull OEM peripheral sales, marketing and customer support activities throughout North America.

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Videotex venture to target home user as future client



OUTSIDE LINES
Bohdan Szuprowicz

Videotex, sometimes called "the electronic library," has received a lot of publicity in recent weeks, topped by the announcement that CBS, Inc., IBM and Sears Roebuck & Co. have ganged up in a joint venture to take over the business. To some industry observers, this means that videotex has finally arrived, but others are not so sure.

The new venture is not in a hurry to offer any services for several years to come. What is significant, however, is the fact that it will be specifically targeting the home computer user as its future client, apparently at about half the cost of what current videotex suppliers are charging. Also, by providing access for any personal computer — whether from the IBM stable or not — the enterprise plans to eliminate the otherwise costly terminal that videotex users must buy or rent today to use the service. This will guarantee the group a multimillion subscriber base potential.

In its present form, videotex is basically an interactive information service using telephone lines or CATV distribution channels to connect a television set or a special terminal to a data base of general or specialized information. Subscribers must pay as much as $600 for the terminal or television set adapter, and they are facing user fees on the order of $15 per month plus telephone connect charges.

Videotex services of this type display mostly previously published material, while the interactive feature provides guidance through the data bases not unlike an index in a library. If the user wants to manipulate such data or perform transactions based on information acquired from various data bases, he must, more often than not, still revert to manual routines of filling out forms, signing checks, licking stamps and going to the bank.

There are at present over 5,000 data bases of all kinds available online, and individual videotex suppliers provide their subscribers with access to one or more such data bases.

Nevertheless, after several years of heavy promotion in over 20 countries, videotex has failed to capture the imagination of the masses, and most suppliers are still trying to discover how many customers are willing to pay for access to information that is otherwise available at a fraction of the cost. So far, no one seems to have discovered the magic formula that brings the price of home videotex services into balance with benefits to subscribers and costs of the operators.

Focus on business

As a result, videotex suppliers have been concentrating on business markets in recent years, peddling transaction-oriented information data bases containing specific facts such as prices, names, addresses and stock quotations that provide a competitive edge to the end user. This is not to say that the home consumer has been forgotten in the shuffle, but it is clear that until the content of videotex services is more appealing, the home videotex user will not embrace such a service on a massive scale.

What also keeps the videotex promoters searching for the magic content formula are the optimistic projections of huge videotex markets in the future, some of which envisage up to 30 million households in North America using videotex by the mid-1990s, when it will become a $30 billion industry.

Recent estimates by Predicasts, Inc. put videotex revenues at about $100 million in 1983, growing at over 100% per year and expected to reach $2 billion as early as 1987. Other forecasts are even more optimistic, predicting as much as $7 billion in revenues in 1987 and up to $10 billion by 1990. But others still do not see that market expanding anywhere near as fast and do not believe it will reach more than $500 million by 1992. These huge discrepancies only underscore the lack of real track record data in this emerging industry.

The entry of CBS, IBM and Sears in a joint venture, however, points to some new directions being taken in the battle to win the home videotex consumer. These are probably best understood when you analyze the operations of the three constituent companies; they offer valuable clues to present and future videotex competition.

Banks and mail-order shopping houses are among the most powerful supporters of videotex because they see it as a means to automate their "front office" activities in an increasingly competitive environment. Sears is, in fact, in both these businesses because it is the largest mail-order house and owns Allstate Insurance Co., Dean Witter Financial Services investment brokers

See **VIDEOTEX** page 152

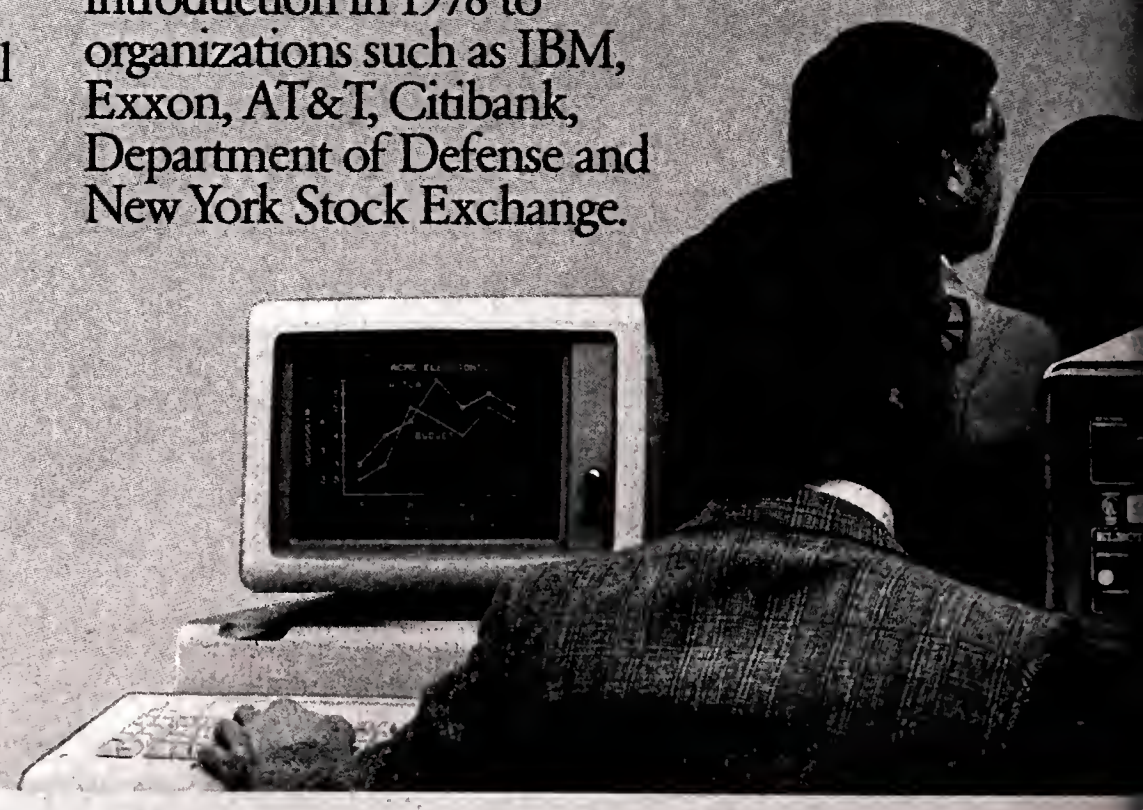
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Former Xerox exec finds advantages to small firm

By Steve E. Owen
Special to CW‡

It's been almost a watchword to most of us growing up that the preferred course is to finish college and get hooked up with one of the big corporations. They offer stability, security and benefits that are often out of reach for employees of smaller firms.

Therefore, it came as something of a shock to my friends and associates, after years of working my way up corporate ladders with two of the largest and best known firms in the world, that I left all that behind to take a position with a small firm. A firm, by the way, that's in direct competition with IBM and Xerox Corp., my former employers.

Granted, the move took me from a mere vice-presidency at Xerox to the positions of president, chief executive officer and member of the board of directors at Western Data Systems, Inc. (WDS). It was not a desire for titles or some personal ambition, however, that helped me decide to make the change. After all, in a business as volatile as computer software and hardware, there is a certain amount of risk involved in such a career switch.

The truth is, there are major advantages that a smaller company has over a larger company. Not the least of the advantages is the opportunity to once again serve customers and not just the stockholders.

That doesn't mean that corporate officers at large companies don't care about their customers — just that priorities are different. When a company has huge capital investments in a particular line of hardware, for instance, its officers have to be constantly cognizant of that fact.

In a small company, the ability — even the necessity — of being responsive to the needs of customers is more highly developed. Customers and products are direct, tangible items with which every person is involved.

Employees are there to see the company grow, to satisfy a market need, not simply to collect a paycheck. There is an excitement, a sense of urgency about the business that is often lacking in larger organizations. There is a flexibility for innovation and change, with no bureaucracy to buck.

In a small company, you can provide 10 improvements to the customer in the time it takes just to get one change approved by an industry giant. A case that speaks to all of the above ideas is that of Western Data Systems itself.

WDS has built its reputation in the field of software development and marketing with an integrated manufacturing and financial system. It's an excellent job shop and manufacturing system, but it had lacked features that one client, heavily involved in government contract work, absolutely had to have.

The upshot was that the company was able to develop a system to meet that client's specific needs. It was able to devote the manpower to bring the whole of the company's resources to bear on the solution of one client's problem.

As a result, a new product was developed that speaks to the specific needs of a hitherto untapped market in the manufacturing industry.

With only two or three layers of top-to-bottom management with which to consult, the decision could be made quickly to take the risk involved in tackling a project like the one outlined. Picture, if you will, trying to get approval of this type of undertaking through the 15 or so layers that exist in huge organizations. You're looking at decisions made in millenia, not hours.

True, the small company makes mistakes sometimes, but progress comes from action, not discussion.

This brings us to another point. In bigger companies, markets are examined and targeted, and products are devised to fit them. The process is backwards, and the solutions devised often fail to anticipate needs that become apparent only by direct customer experience.

Smaller companies tend to reinvest earnings to products and services, not overhead resulting from a massive support structure.

The case of Texas Instruments, Inc.'s sudden pullout from the home computer market illustrates this point. According to news reports at the time, a multimillion dollar advertising campaign was already under way and couldn't be stopped, despite the fact that the computers were going for a song at every discount house and computer store in the country. Possibly the decision was made to continue the campaign just to deplete the warehouse stock, but it's hard to believe it was cost-effective on that basis.

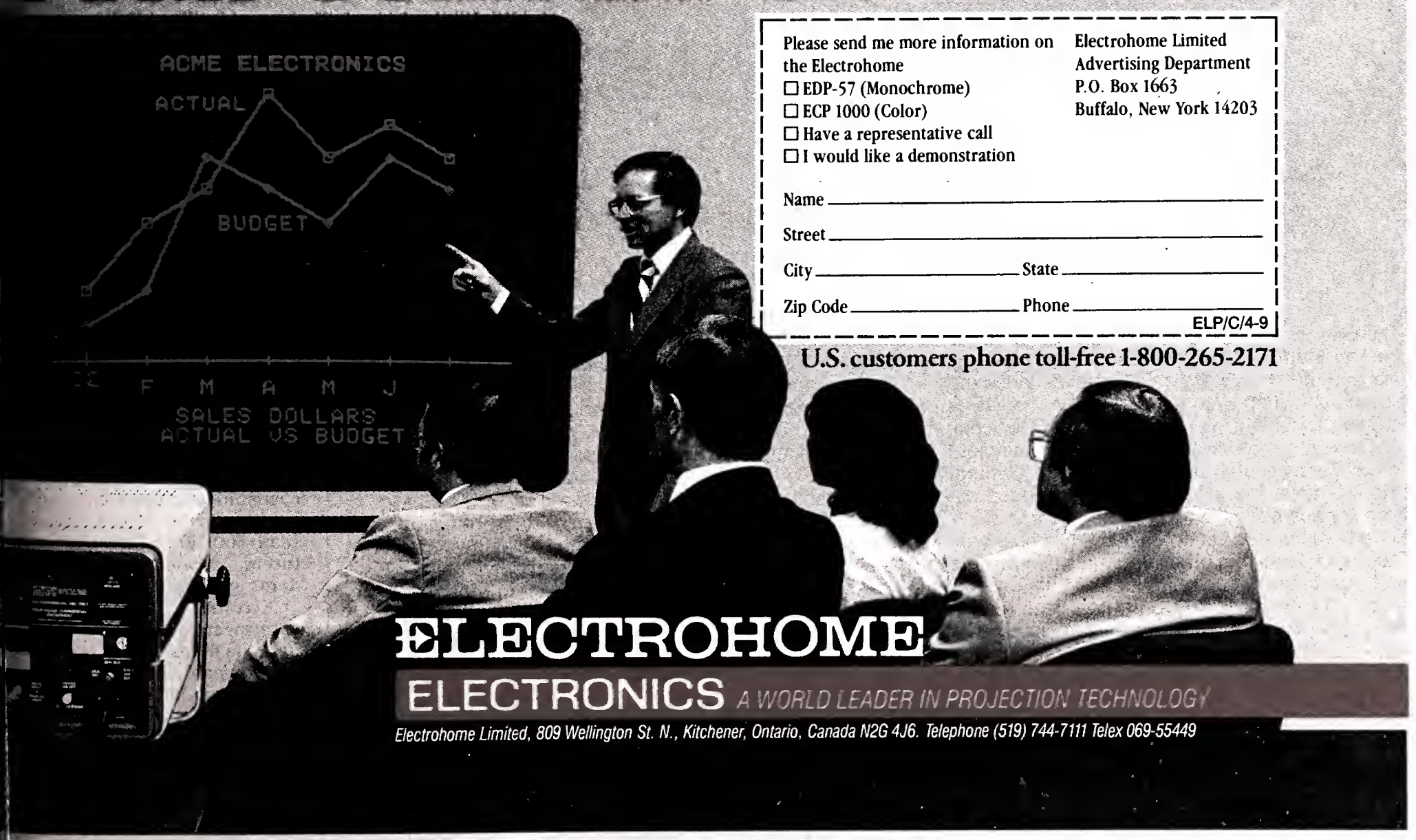
Granted, TI will survive, while a setback like that might have destroyed a company with more limited resources. On the other hand, the smaller outfit would probably have been unable to make such an overcommitment.

In summation, it must be granted that giving up the security and the resources available in a large company is no easy thing. I'm not saying that big is bad, at all. There are disadvantages to being with a small firm that some may feel I've glossed over.

Small isn't for everyone, it's true, but the feeling of excitement, of being able to respond to customer needs in a tremendous industry, is right for me.

Owen is president, chief executive officer and member of the board of Western Data Systems, headquartered in Calabasas, Calif. Previously he was vice-president of planning, development and product marketing for Xerox Computer Services.

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RCA Service realigns its communications business

CHERRY HILL, N.J. — RCA Service Co. announced recently a reorganization of its commercial communications businesses in a move designed to offer a new level of service to business customers.

The reorganization combines the company's existing data services business with a new automated business communications organization in a single division under the direction of Earle A. Malm II, formerly the division vice-president of telephone systems and data services.

The telephone systems business will now report to Raymond J. Sokolowski, division vice-president of consumer and commercial services, according to a spokesman for RCA Services, a division of RCA.

Malm said the company's "new thrust focuses on developing systems for businesses that have complex data and voice communications requirements. We are investing in the future while building on [RCA] Service Co.'s extensive distribution and service network.

"With our planned investments in automated business communications, we intend to offer systems designed to solve specific customer-application problems. And we will support those systems with high-quality user training, documentation and service," he said.

The reorganization will not affect RCA's telephone systems customers, Sokolowski said.

But the company reportedly plans a more regional structure in managing the sales force and intends to transfer the majority of sales and support personnel into regional offices and existing branches.

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Comsat mulls SBS pullout

WASHINGTON, D.C. — Satellite Business Systems (SBS), the joint satellite network venture, may be in the process of losing one of its founding partners.

Communications Satellite Corp. (Comsat) recently confirmed rumors that it is thinking of cutting its losses in the business that was formed with IBM and Aetna Life & Casualty Co. as partners by reducing or selling its interest in the venture.

SBS has reported losses of more than $120 million in each of its three years since it was founded.

In a related development, American Information Technology, one of the seven regional telephone companies, said it had signed a five-year agreement with an SBS subsidiary, SBS Real Estate Communications Corp., to provide communications equipment and services worth a reported $130 million.

Nata to get gear orders

WASHINGTON, D.C. — The Bell Atlantic telephone companies have agreed to process all equipment service orders through the North American Telecommunications Association (Nata).

Nata is the trade association of the competitive telecommunications equipment industry, representing more than 600 non-Bell manufacturers, suppliers and vendors.

According to Nata, the agreement was designed to help the divested Bell operating companies facilitate the installation of business telephone equipment while ensuring that customers of competitive equipment vendors are not discriminated against in receiving those services.

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Riches and power don't always go together. Take Plexus, for instance. The world's most powerful UNIX*-based supermicros.

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No waiting for file transfers. And that's a decided improvement over everything else that's out there.

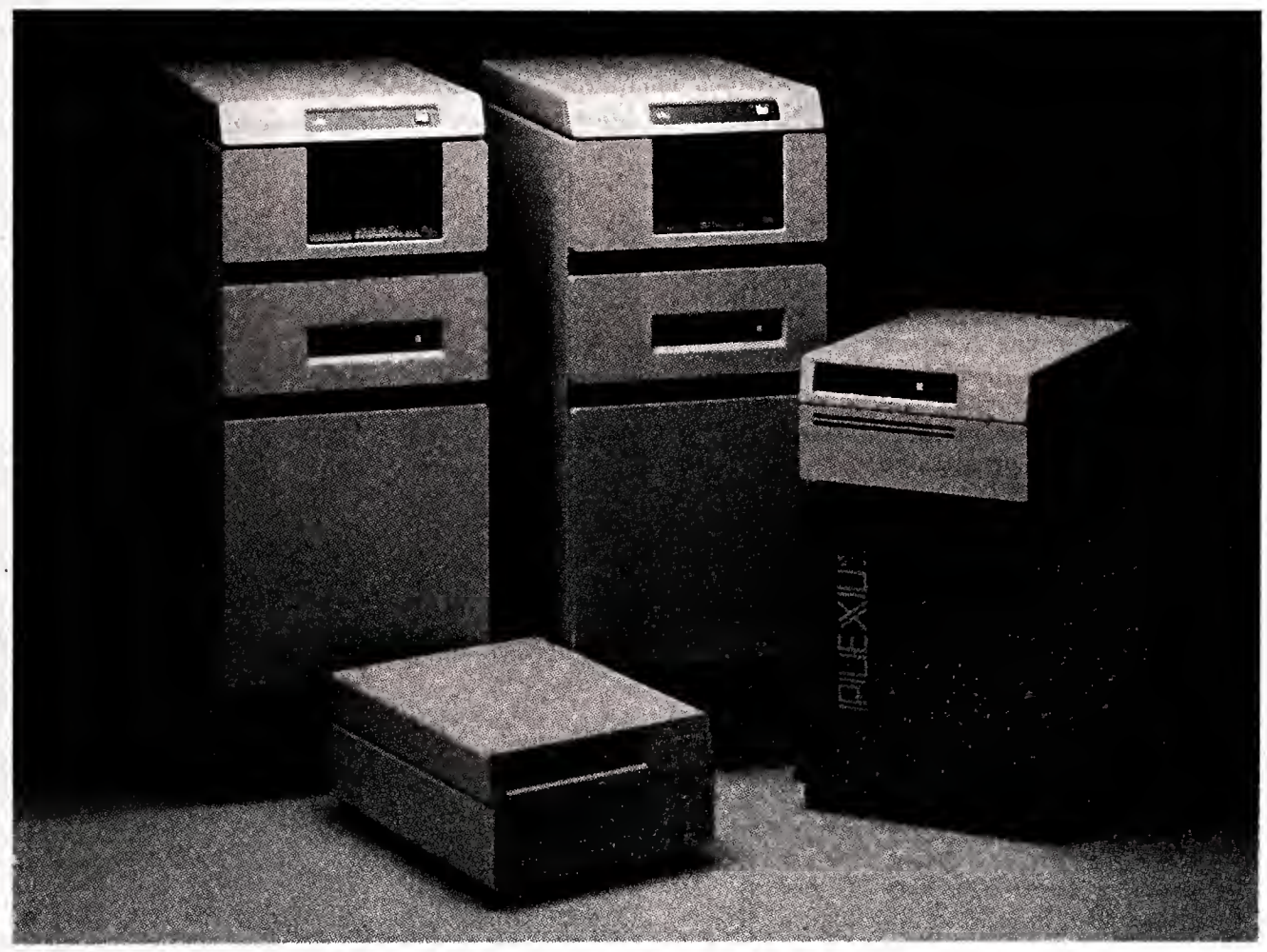
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COMPUTER INDUSTRY

EXECUTIVE CORNER

C.M. Chung has been elected president and chief operating officer of General Instrument Corp.

■

Mitsubishi Electronics America has named four new executive vice-presidents. They are **Ric Fochtman,** administrative and operations group; **Yoshiro Kitada**, electronics and communications group; **Hiro Taniguchi**, semiconductor division; and **Rempel Tsuchiya**, assistant to the president.

■

Daniel A. Hosage has been appointed chief executive officer at Davox Communications Corp.

■

Russell J. Bik has been appointed vice-president of operations at Sun Microsystems, Inc.

■

Richard H. Lussier has resigned as executive vice-president and a director of Rasstor Systems Corp.

■

Angelo V. Cappuccio has joined California Devices, Inc. as chief financial officer.

■

Informatics General Corp. has announced the following appointments in the Financial and Insurance Systems Group: **M.L. Bradley**, group vice-president; **Terry D. Jung**, vice-president, finance and administration; and **William L. Alton**, vice-president of sales. **Stanley A. Alekna** has been promoted to vice-president/general manager of the company's Life Insurance Systems Division.

■

James G. Warner has been named vice-president of Cortex Corp.

■

Arthur J. Schnieder has been named vice-president, advanced technology, in the computer systems operations of Sperry Corp.

■

John Molitor has been named president and chief operating officer of BKW, Inc.

■

David C. Fries has been appointed president and elected a director of Ibis Systems, Inc.

■

Robert A. Holub has been appointed chief financial officer of Tymshare, Inc.

■

Carole Morton has been named president of Dylakor, Inc.

■

Roger Gower has been named president of Qume Corp., succeeding **David Sen-Lin Lee,** founder of Qume, who has been named a vice-president of ITT and head of ITT's Business Information Systems Group.

■

Peter A. Davis has been elected president of Open Systems, Inc., the microcomputer division of University Computing Co.

■

Stephen G. Jerritts, president of Lee Data Corp., has been elected to the additional office of chief executive officer, succeeding company founder **John M. Lee.** Lee will remain chairman of the board of directors. **Wayne A. Zuchlke** has been elected vice-president, corporate controller and treasurer of the company.

■

Jim M. Smaha has been promoted to vice-president and general manager of the semiconductor division of National Semiconductor Corp.

■

Robert W. Casey has been named vice-president, international, at The Ultimate Corp.

■

John J. Christman has been named corporate vice-president and general manager of the data products division of Facit, Inc.

■

Ronald W. Braniff has been appointed president of ASK Computer Systems, Inc. **Sandra Kurtzig,** founder and former president of ASK, continues as chief executive officer and chairman of the board.

■

Scott McNealy has been appointed president and chief operating officer of Sun Microsystems, Inc.

■

Terry D. Carder, president of Reynolds & Reynolds Co., has been named chief executive officer following the resignation of **E.F. Strasser.** Strasser will remain chairman of the board. **Budd L. Tipple** has been named senior vice-president and chief operating officer.

■

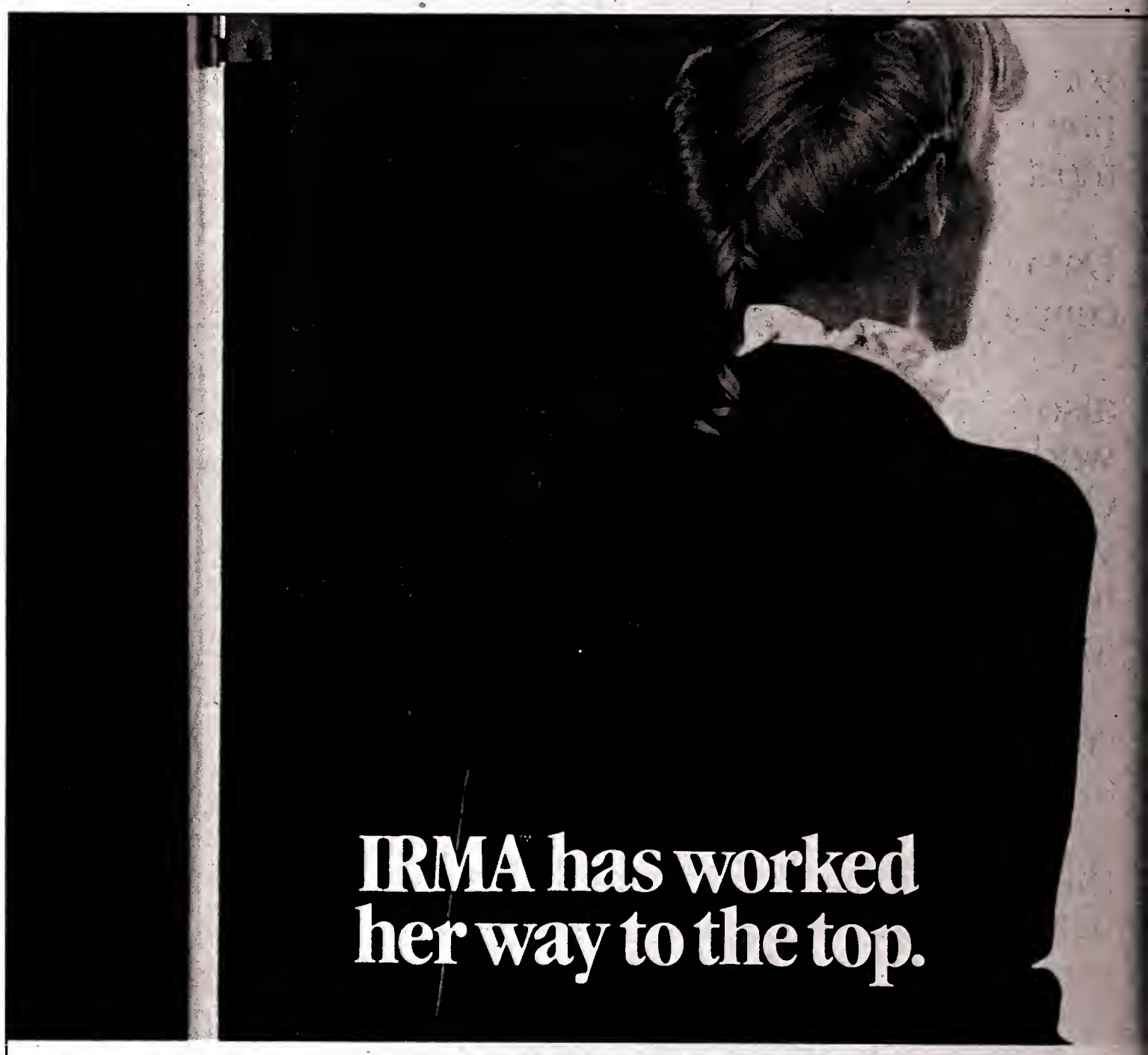
Richard Kemp has been appointed chief operating officer and general manager of Wordplex Corp.

Amdahl income seen down in '84

SUNNYVALE, Calif. — Amdahl Corp. announced recently it expects first-quarter 1984 income to be less than experienced during the comparable period one year ago.

According to John C. Lewis, Amdahl president, "The results of our European operations will be below expectation for the first quarter. This is mainly caused by 580 processor installation deferrals in favor of models and features which will commence volume shipment in the third quarter and by the negative effect on earnings of foreign exchange rates as compared to a year ago."

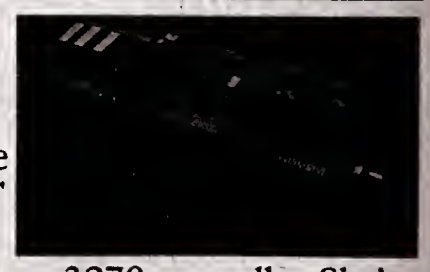
In the first quarter of 1983, Amdahl earned $7.4 million, or 12 cents per share, on revenues of $171.6 million. Analysts generally expected some increase for the first quarter of this year.



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HP exec reveals Personal Productivity Center concept

By Robert Batt
CW West Coast Bureau

LOS ANGELES — "The office will be the backbone of all our computer activities over the next four to five years," a Hewlett-Packard Co. executive said here recently while announcing a strategy to market integrated office automation systems based around microcomputer networking.

Edward McCracken, general manager of HP's Business Development Group, announced the company's Personal Productivity Center concept at a press conference during the 1984 Office Automation Conference, sponsored by the American Federation of Information Processing Societies, Inc.

McCracken said HP will center its office automation marketing efforts on systems integrating the HP 3000 distributed processing system, interactive office software and the HP 150 touch-screen personal computer.

HP officials said the concept will provide office professionals, support people and clerical staff with word processing, personal file, graphics, spreadsheet analysis and data processing capabilities.

McCracken said the Personal Productivity Center is HP's response to swiftly merging markets for data processing, personal computing, office automation, word processing and networking capabilities.

The integrated market, he said, will create a need for a departmental work-group computer that will effectively manage a network of personal computers and office workstations handling both data processing and office applications, such as word processing and electronic mail.

"By tightly integrating the functions of personal computers, secretarial workstations, departmental computers and office software, we believe we can serve a market which is expected to reach $23 billion by 1988," McCracken asserted.

The company intends to provide applications access, data access, resource sharing, communications services and information management to users of both personal computers and MIS.

"The concept of the Personal Productivity Center lets personal computer users, who have developed individual applications on their personal computers, also take advantage of the more powerful data bases or office software on larger computers," McCracken explained.

HP officials said a small Personal Productivity Center might consist of several HP 150 touch-screen personal computers used as managerial workstations, HP 2628 secretarial workstations, an HP 3000 business computer and various office software.

Larger Personal Productivity Centers could link more than 100 personal computers or workstations in a single HP 3000-based network.

Embracing the concept of open architecture, company officials announced that in the future conversion capabilities between HP's word processing software and other key WP products will be provided. One example, they noted, is the current development of an interchange facility between HP Word and Wang Laboratories, Inc. products.

5¢ 10¢ NICKELS AND DIMES

Analogic Corp.'s reported sales for the second quarter ended Jan. 31 were $36.5 million. Net income increased 39% to $4.9 million, or 27 cents per share, from $3.5 million, or 21 cents per share, in 1982.

■

Ionics, Inc.'s reported revenues for the year were $54.2 million, down 13% from 1982. Earnings per share of 37 cents were up 19% from the fourth quarter of 1982.

■

American Software, Inc. reported revenues for the third quarter of fiscal 1984 were $6.2 million, up 37% from 1983. Net earnings increased $1.3 million, or 33 cents per share, up 41% from $980,000, or 28 cents per share.

■

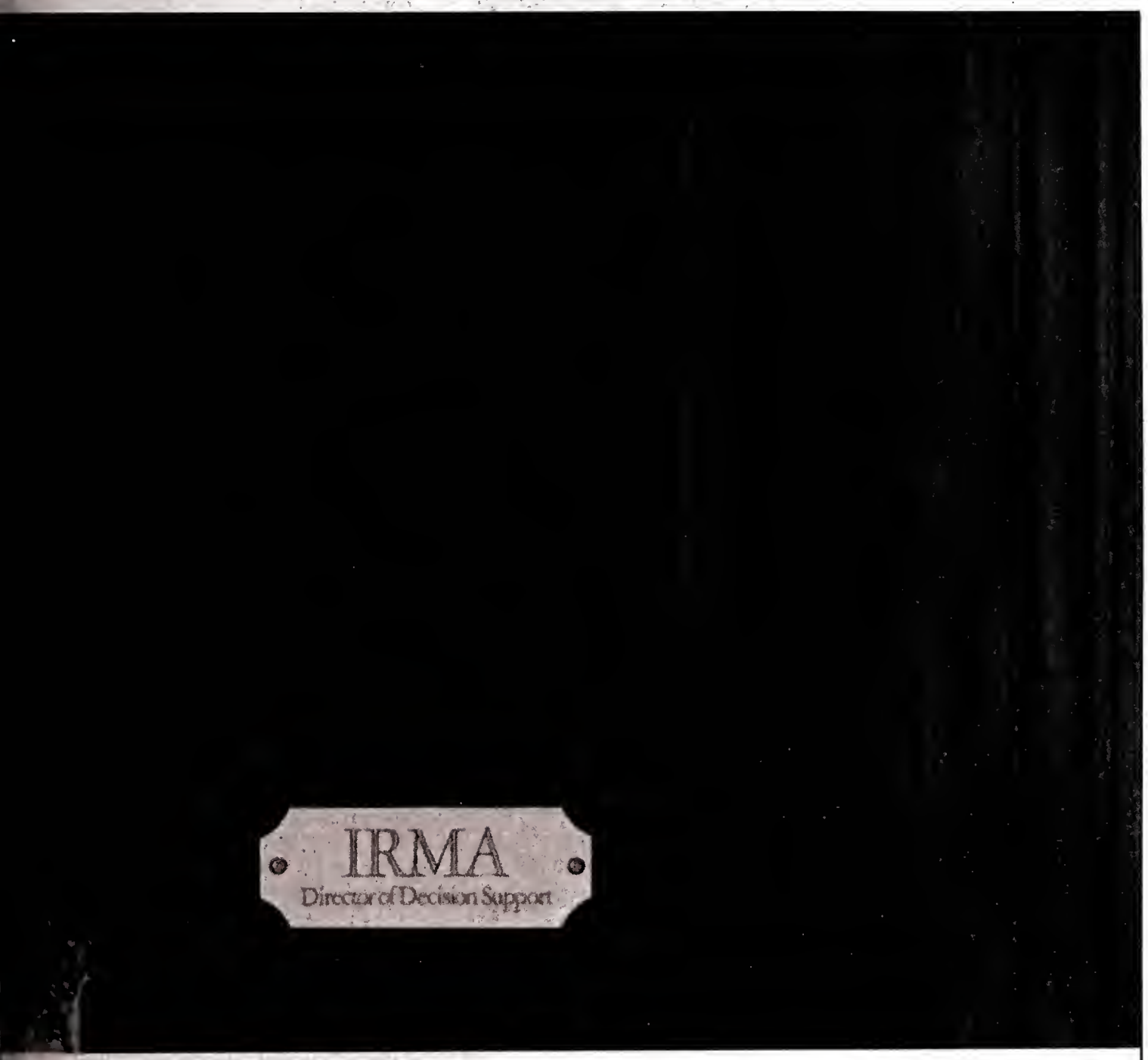
Applied Data Research, Inc.'s reported revenues for 1983 were $89 million, an increase of 30% over 1982. Income was $12 million compared with $8.3 million, a 43% increase. Net earnings for 1983 were $6.9 million, or $1.45 per share, compared with $4.7 million, or $1.16 per share, in 1982.

■

Schuchardt Software Systems, Inc. approved a 2,000-for-one split of the company's common stock, increasing the company's authorized shares to 2,400,000. The split will be effective to shareholders March 30, and shares will be distributed April 16.

■

Scarborough Systems, Inc. has obtained private equity financing of $6 million from an investment group. The financing group was assembled and coordinated by Alex Brown & Sons and by Morgens, Waterfall & Vintiadis.



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SUPERSHORTS

Educom Computer Literacy Project has been awarded a $50,000 **Exxon Education Foundation** grant to support activities during 1984.

■

Cobe Laboratories, Inc. has entered negotiations with **IBM** for the possible purchase of a portion of assets of IBM's Biomedical Systems.

■

Data General Corp. has expanded its software development environment marketing program by appointing **Rolm Corp.** as the marketing representative for **Ada Work Environment.**

VIDEOTEX from page 146

and Coldwell Banker Commercial Group, a nationwide commercial real estate broker firm. All of these operations could vastly improve their sales and productivity through transactional videotex services because they deal mostly in transmitting information.

IBM is also eminently suited to provide the hardware and software linking the ubiquitous IBM Personal Computer and other personal computers into sophisticated data bases that will also provide priceless real-time consumption and demand patterns to product and service suppliers that will cooperate with such a conglomerate.

CBS, on the other hand, can provide the customized entertainment content for such networks to take some of the boredom out of the more mundane videotex applications. There have been suggestions of interactive soap operas, for example, where subscribers get an opportunity to influence the unfolding story by voting to kill a particularly nasty character or to play the latest video games delivered electronically to their homes for a tryout.

For the individual investor, however, videotex does not appear to offer any unusual investment opportunities. Videotex services require huge resources, and other such ventures as Dow Jones & Co.'s News/Retrieval Service, Times Mirror Co.'s Videotex America, AT&T and Knight-Ridder, Inc.'s Viewdate and others are being introduced by large corporations or even larger joint consortia.

SEMI from page 135

erasable programmable read-only memory devices; and the F245 microprocessor from Fairchild Camera & Instrument Corp.

Most computer manufacturers have adopted a multisupplier strategy in order to secure the parts they need. Altos Computer Systems, Inc., for instance, uses five U.S. vendors and three overseas manufacturers to supply itself with the 750,000 chips a month, including 100,000 dynamic RAMs, used in the production of its range of 8-bit and 16-bit small business computers.

"We have seen a definite lengthening of lead times, and over the last two months, we have been forced to obtain an increasing number of devices from distributors — up to 15% of our total supply — which means we are paying premium prices on those parts," Gary Strewter, vice-president of manufacturing at Altos, commented.

David Cochran, vice-president of quality, reliability and technology at Xebec Corp., a San Jose, Calif.-based manufacturer of hard disk drives and controllers, said prices are rising dramatically. "The spot market has increased tremendously, with a several dollar premium paid for those hard-to-get parts that have to be procured now to fill system deliveries," he claimed.

Exorbitant prices

Cochran said prices have already become exorbitant, with contracts made six months ago being ignored by semiconductor vendors in favor of renegotiated or more lucrative contracts.

According to Dick Rathman, vice-president of engineering at Durango Systems, Inc., a Silicon Valley-based small systems manufacturer, the rise in prices for large-scale integrated processor parts (from approximately 15 cents a piece in 1982 to over $1.40 a piece today) is typical of what is happening in the marketplace.

"Because of the shortages, we are having to carry excess inventory and pay premium prices to ensure we get what we need. With the larger semiconductor vendors, most of the chips are already allocated, which means we cannot ramp up production even if we wanted to," he said.

William Strauss, vice-president at Integrated Circuit Engineering Corp., a Scottsdale, Ariz.-based market research firm, predicted bankruptcies, particularly in the personal computer market: "There will be companies that cannot ship their computer products because of the lack of chips. The question is how long can they hold up without sufficient supplies? Those who survive may well be those who can afford to pay the expensive prices demanded and who can afford to ship their products at a loss for a while."





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"IDMS/R represents a major advance in database technology."

Dave Litwack*



**David Litwack is Cullinet's Vice President of Product Development. Mr. Litwack has contributed significantly to the many technical advances Cullinet has achieved in database software products, including IDMS/R. Mr. Litwack joined Cullinet in 1976. He is a Cum Laude graduate of Brandeis University and holds a Masters in Computer Science from Boston University.*

Because IDMS/R is the first relational DBMS designed for both the DP professional and the end user.

IDMS/R is not only a relational database management system, but a particularly powerful one. IDMS was made relational by removing all pointers and allowing the user to define data as tables and providing the traditional relational operators such as selects, projects and joins. The major benefit of a relational DBMS is the capacity to develop applications faster because the developer does not have to be concerned with the database design. IDMS/R provides this and much more.

For example, the Automatic System Facility (ASF) of IDMS/R is a major advance over fourth generation languages. The ASF is so comprehensive and easy to use that all a user need do, to develop an application, is define a relational record. The Automatic System Facility dynamically generates all necessary supporting structures including data definitions, screen formats, application processing logic, and documentation. So, the developer can witness the application being produced, literally, in seconds. This capability makes IDMS/R the perfect system for the end user.

Data processing professionals can use the ASF to help develop production applications. The ASF can be used to build a prototype that can be enhanced, using Cullinet's fourth generation language, ADS/OnLine, into a complex production application. But, when they build a complex high volume application using IDMS/R, DP professionals require outstanding performance. Typically, 5% of the data relationships (joins) in any application are accessed 95% of the time. With IDMS/R, they can simply change these relationships to predefined joins and benefit from a dramatic boost in performance. We call it Relational Fastpath. Relational Fastpath makes IDMS/R a unique DBMS and a perfect system for DP professionals' system development needs.

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IDMS/R Seminar cities and dates

City & State	Date	City & State	Date	City & State	Date
Albany, NY	June 12	Fairfield, NJ	June 7	Ottawa, ON	May 8
Albuquerque, NM	May 2	Ft. Worth, TX	June 12	Ottawa, ON	June 5
Anchorage, AK	May 23	Grand Rapids, MI	June 7	Phoenix, AZ	April 12
Appleton, WI	April 12	Greenville, SC	May 24	Pittsburgh, PA	May 16
Atlanta, GA	May 15	Harrisburg, PA	May 8	Portland, ME	May 15
Atlantic City, NJ	May 10	Hartford, CT	May 9	Quebec City, PQ	May 17
Austin, TX	May 31	Houston, TX	May 10	Regina, SK	June 13
Baltimore, MD	June 5	Indianapolis, IN	May 8	Richmond, VA	May 16
Battlecreek, MI	May 15	Jacksonville, FL	May 1	Sacramento, CA	June 5
Boston, MA	May 23	Kansas City, MO	May 2	St. Louis, MO	April 11
Boston/Danvers, MA	May 3	Knoxville, TN	June 13	San Antonio, TX	May 16
Bridgeport/ New Haven, CT	May 22	Lincoln, NE	June 7	San Diego, CA	May 8
		Los Angeles, CA	May 1	San Francisco, CA	May 24
Calgary, AB	May 23	Louisville, KY	May 10	San Jose, CA	May 15
Charlotte, NC	May 10	Lubbock, TX	May 1	Seattle, WA	June 12
Cheyenne, WY	May 22	Lynchburg, VA	May 17	Springfield, IL	May 17
Chicago, IL	May 3	Miami, FL	May 17	Tampa, FL	June 6
Chicago, IL	June 12	Milwaukee, WI	May 1	Toledo, OH	April 11
Cincinnati, OH	May 14	Milwaukee, WI	June 14	Toronto, ON	May 17
Cleveland, OH	May 24	Morristown, NJ	May 8	Tulsa, OK	May 22
Colorado Springs, CO	May 16	Nashville, TN	May 3	Valley Forge, PA	May 17
Columbia, SC	April 12	New Orleans, LA	May 24	Waco, TX	May 15
Columbus, OH	May 2	New York, NY	May 15	Washington, DC	May 9
Dallas, TX	May 15	New York/Rye, NY	June 12	Wichita, KS	June 6
Denver, CO	June 13	Norfolk, VA	June 14	Wilmington, DE	May 22
Des Moines, IA	May 16	Omaha, NE	June 13	Winnipeg, MB	June 12
Detroit, MI	May 23	Orlando, FL	May 24	Worcester, MA	May 24

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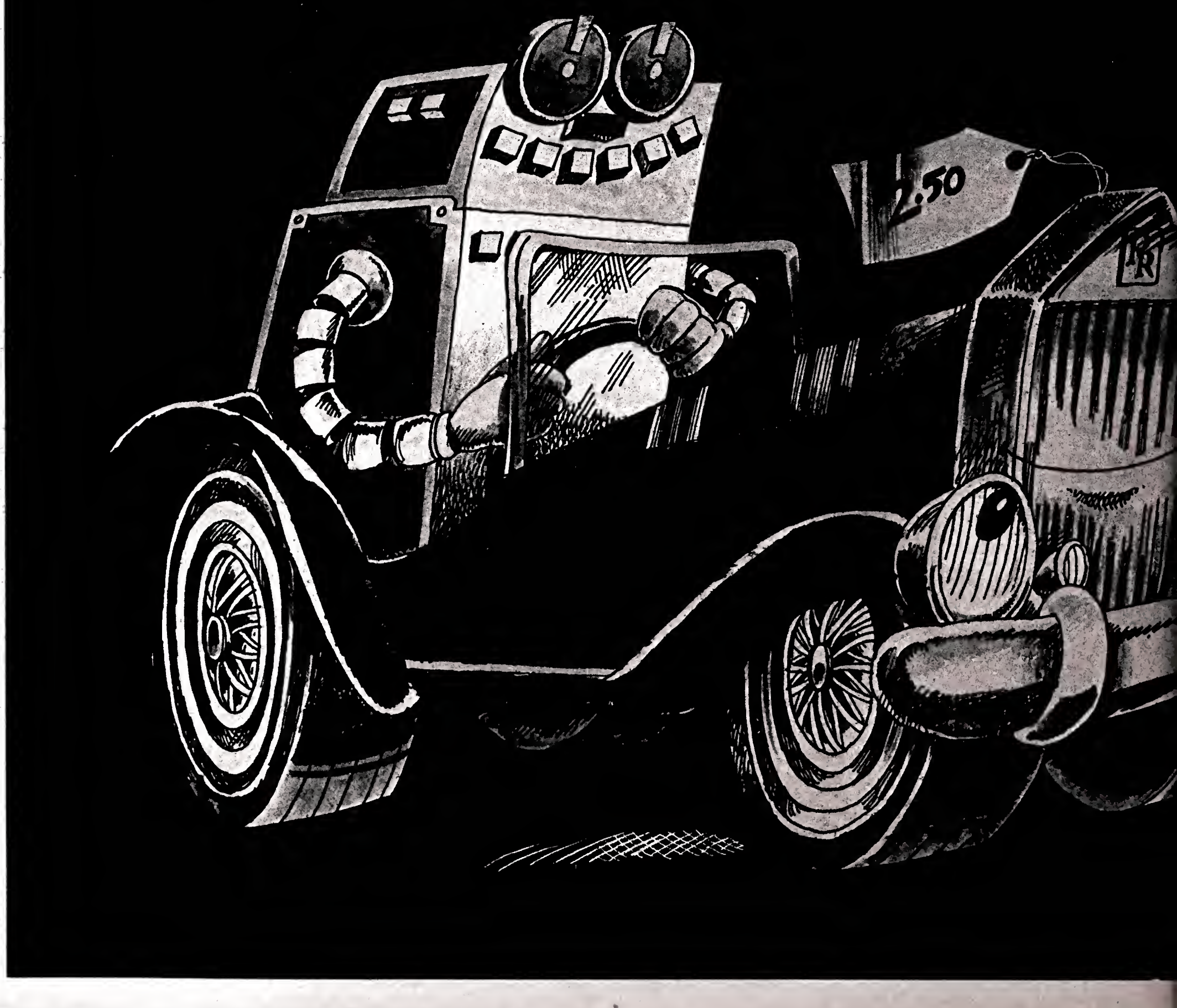
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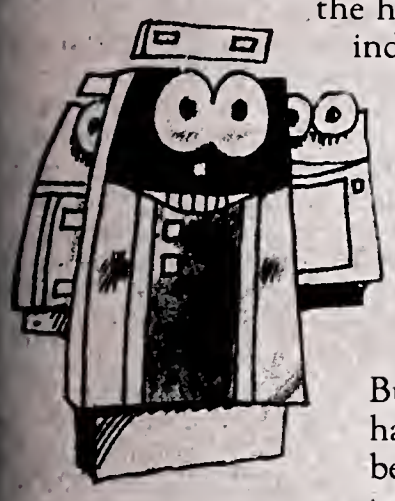
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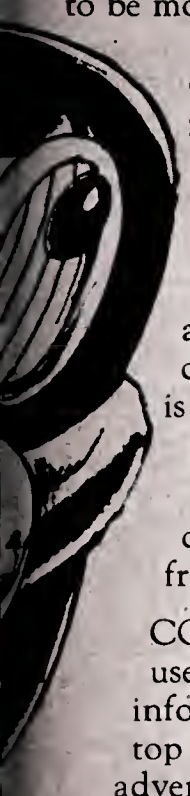
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Most of our publications are weekly newspapers, because so many things happen so rapidly in the computer business (as the headline quote from a prominent industry executive makes so clear). In only thirty years the industry has gone from the development of the giant Eniac system, through the tube-powered, water-cooled Univac I (the world's first business computer), to the incredibly cheap, battery-powered microprocessor.



But as unbelievable as the last 30 years have been, the next 30 will probably be even more incredible. In the next two years alone, the installed power of general purpose computer systems will grow almost as much as it did in the previous 16 years. And the supercomputers of the 90's will transfer data at a rate several hundred times faster than even today's speedy computers! It's hard to remember this is real science, not fiction.

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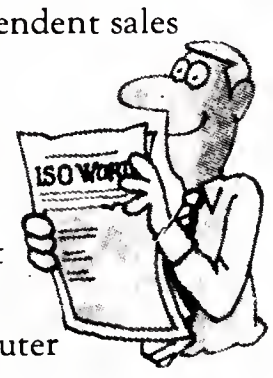


A constant flow of new products; rapid changes in technology; more and more new applications; and large and growing expenditures. It's an industry with a strong need for current, complete and accurate information. Which is where we come in.

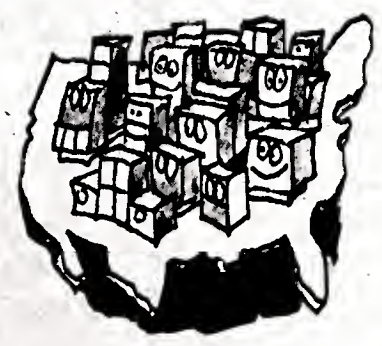
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The latest phenomenon of the computer industry is personal and desk-top computers and we're covering it with our newest publication, INFOWORLD and PC WORLD. INFOWORLD is a weekly newspaper for all micro users and it features complete software and hardware reviews, while PC WORLD is a monthly magazine devoted to users of the IBM PC and compatibles.



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MART from page 135

— have a harder row to hoe in winning consumer confidence. "We have to be a little more giving, more flexible, in extending our 'consumer protection' coverage," according to Chuck Newman of Newman Computer Exchange, Inc., a DEC aftermarketer based in Ann Arbor, Mich.

What has helped legitimize the business even more, Newman said recently, is the emergence of a slew of price-trend reporting services.

Since most of the blue book publishers also happen to be used computer dealers, a caveat emptor seems to be in order: Charlie C. Greco, director of Financial Information Planning with International Data Corp., an industry analysis firm in Framingham, Mass., said, "I would suggest deducting at least seven points going in, and on top of that, question the availability of the product."

Forearmed with price information, the careful shopper should know precisely what he wants, according to Ken Bosomworth of International Resource Development, Inc. of Norwalk, Conn., another industry analyst. "Virgins should stay clear of the used market, but then most do," he added. "First-time users need the support systems that only the manufacturer can provide."

Dealers shy away from giving advice. "We don't want customers to buy on our say-so and then discover it doesn't meet their needs," Newman pointed out. Added CDLA President Rick Forsythe, "I think of us as soybean traders who've never seen the farm."

IBM still an influence

While IBM may no longer own the equipment, it still influences the asking price. "The secondary market lives permanently in the shadow of IBM," Forsythe admitted.

Steve Deixler of Princeton Computer recalled when IBM, a few years ago, announced price cuts for its 3350 disk drive in anticipation of introducing the more advanced Model 3380. The aftermarket became glutted with the earlier model, and prices plunged precipitously. Then IBM encountered some production problems, and the 3380 debut was delayed, so 3350 prices shot up. Then the 3380 began coming on stream, and prices plunged once more, now down to 20% of what IBM had discounted it to. "It's a yo-yo that can drive you bananas," Deixler complained.

It also troubles some dealers that IBM will refurbish turned-in equipment and reintroduce it to its primary market as brand new.

If there is such a thing as an "average" savings to be realized by tapping the secondary market, the consensus seems to be anywhere from 15% to 20%. It makes no difference whether the equipment is actually used or still fresh in the box.

On an individual basis, of course, savings can be enormous. It's still possible to pick up an IBM 3031 or 3033 disk drive for as much as 98% off — or two points short of a giveaway.

And that's really the biggest reason for going to the aftermarket; not just to pick up a bargain, but to get immediate delivery when the manufacturer smiles patronizingly and tells you it can't be done.

Next week: Big Blue's Credit Corp. has aftermarket dealers nervous.

Model is a former editor and contributor to several publications and is a public relations consultant to government and industry.

UNIX from page 135

future operating systems from other vendors. Consequently, the jury will remain out for a while as to whether AT&T can become a key player in the information processing marketplace. ■

Storage Technology Corp. (STC) said recently it is studying IBM's recent announcement of the 3480 tape subsystem. STC said it has developed the technology "needed to move in several directions"; move it must, and rapidly, in a focused direction.

For STC to leapfrog IBM, the obvious direction would be rapid development of its optical storage subsystem technology. Pure archive application is one thing, but what is really needed to leap ahead is a cost-effective means of reusing optical storage disks.

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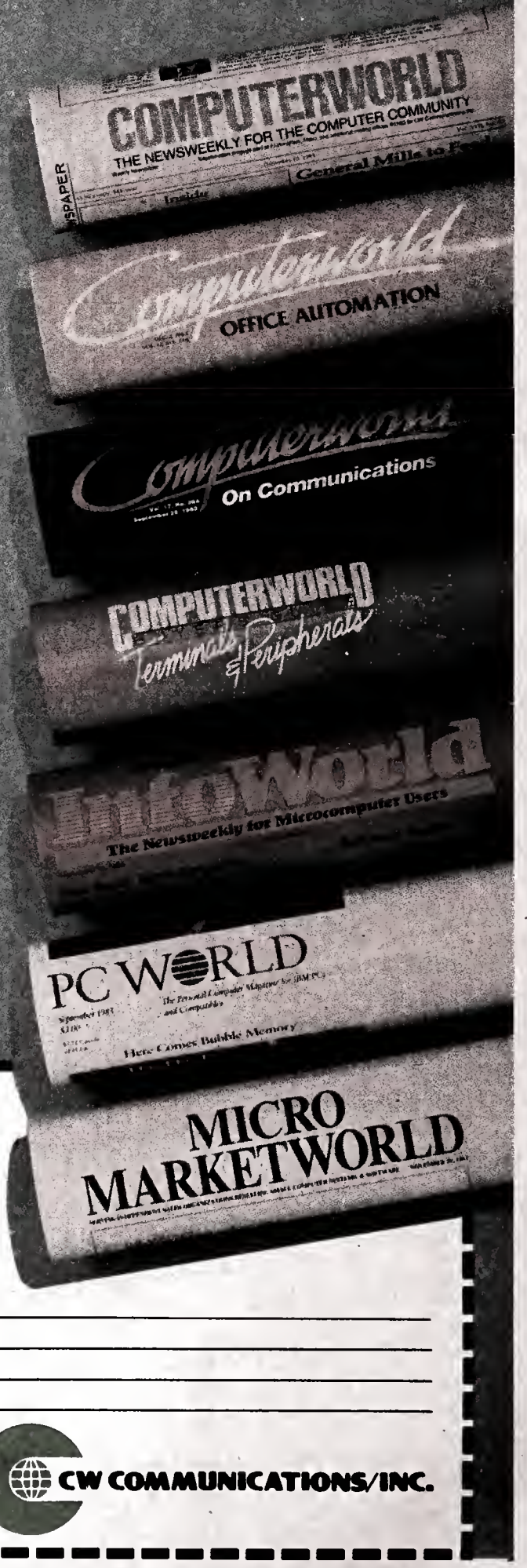
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SOFTWARE ENGINEER/COMPUTER SCIENTIST
ELECTRICAL ENGINEER MECHANICAL ENGINEER
GROWTH CAREERS IN OPTICAL STORAGE

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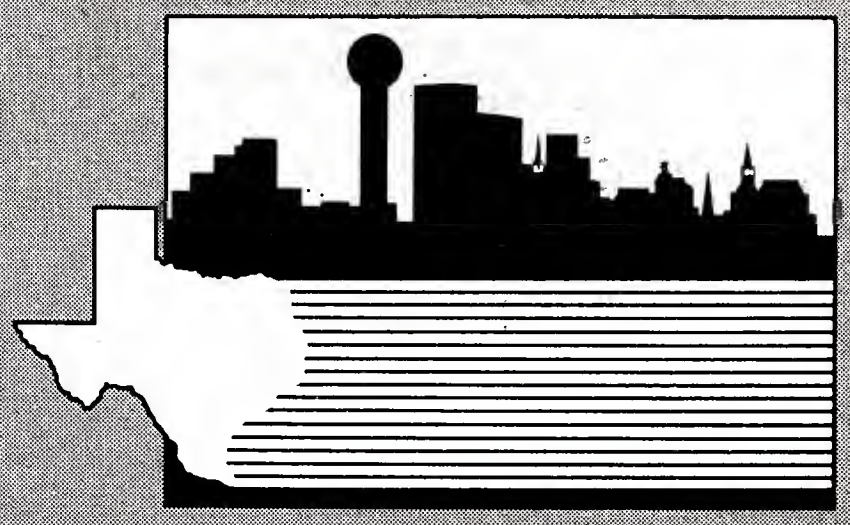
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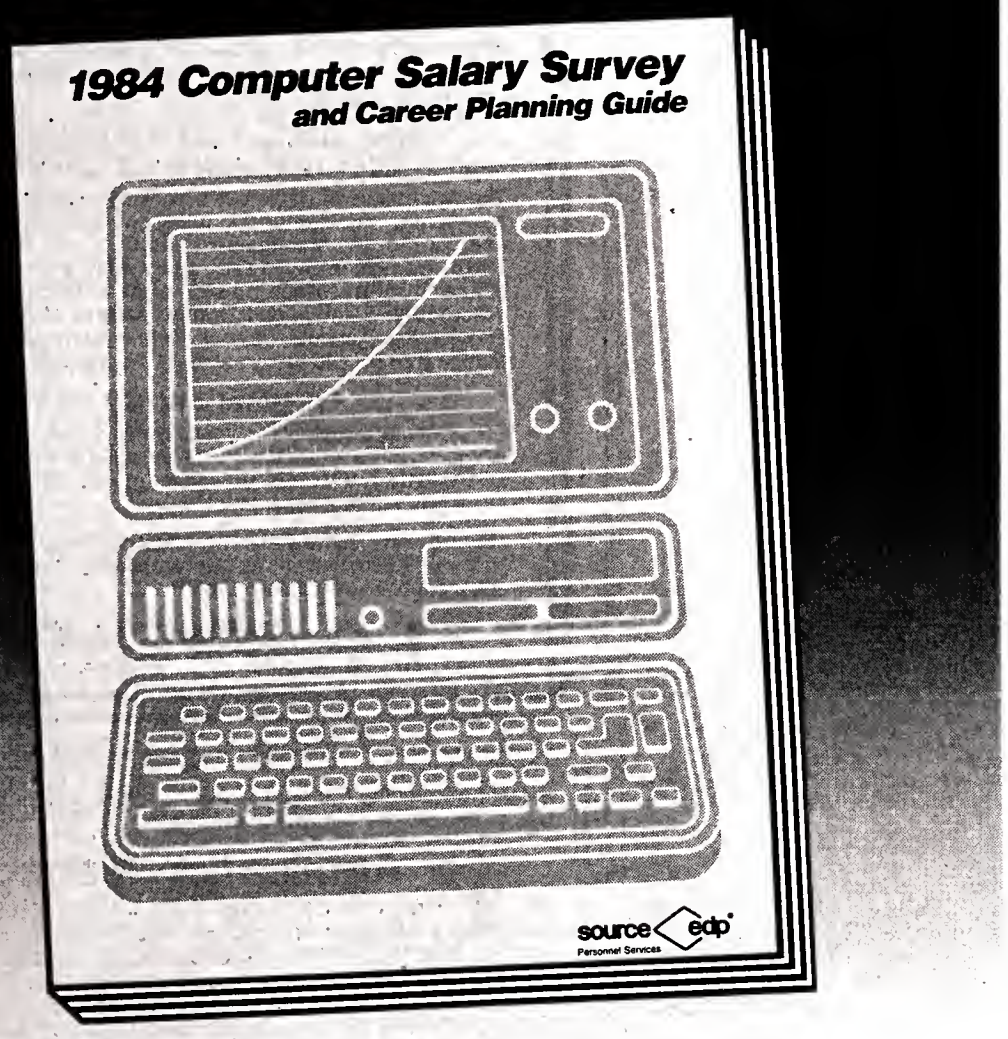
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I B M SYSTEMS PROGRAMMERS
I B M PROGRAMMERS - ANALYSTS

The positions below reflect a portion of the active openings for which we are recruiting. They are with Fortune 500 and large regional firms across the country, with many openings in the Southeast.

TECH. SUPPORT	
Systems Programmer OS/MVS-GENS	$30-42K
Systems Programmer - VM GURU	$36-44K
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Sr. Systems Analyst - Hogan-Cash Mgmt.	$25-38K
Programmer/Analyst CICS (COMMAND & MACRO)	$22-36K
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Systems Analyst 5/7 yrs COBOL-IMS/VS, CICS/VS	$28-40K
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Senior Analyst OS/MVS COBOL - Mfg apps.	$30-40K
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Client companies assume all fees - inlcuding interviewing and relocation costs. Installations are "State of the Art" and offer excellent career path progression. Forward your resume now or call collect for additional information.

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Richard P. Rita, a multi-office organization with 13 years experience in Data Processing placement has outstanding opportunities for qualified individuals in state-of-the-art environments throughout Florida. We currently have openings for: Systems Managers, Project Leaders, Programmers & Syatems Analysts, Tech Support and Communications. Positiona are in large IBM installations. Salaries range from $20-40K depending upon background and qualifications. All fees, interview and relocation expenses are paid by our client companies.

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data processing

SOFTWARE TECHNICAL WRITER
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ISC Systems Corporation, the leader in microprocessor-based terminal systems for the financial industry, has an outstanding opportunity for a Software Technical Writer.

To qualify for this position, you must have a BS in computer science, math or electrical engineering, plus three years practical experience in software engineering or its equivalent and two to three years experience as a writer.

This position researches, writes, edits and coordinates the production of manuals for ISC software products, including both user-level manuals and programmers reference manuals.

ISC offers an excellent salary and comprehensive benefits package. If you are interested and qualified, send your resume to: B.J. Miller, **ISC Systems Corporation,** P.O. Box TAF C-8, Spokane, WA 99220. ISC is an equal opportunity employer.

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You eat, sleep and dream UNIX.

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Yes, Colorado.

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We're looking for UNIX operating systems specialist to head up a new consulting effort. You step in and provide problem solving help and technical guidance to Digital Software Specialists.

And we want you to get involved with the client directly — see them if necessary to resolve problems.

The requirements are stringent. You must have 3+ years experience using the UNIX operating systems and its associated tools — and a substantial background as a UNIX operating system manager or exposure to UNIX operating system internals, preferably Berkeley UNIX operating system. 3+ years experience using "C" language is also required.

Of course, strong customer relations skills are critical as are good written and verbal communications skills.

If you want to see the 'great outdoors' one more time, contact S. Chamberlain, Digital Equipment Corporation, Dept. 0401 3804, 4405 N. Chestnut Street, Colorado Springs, Colorado 80907.

We are an affirmative action employer.

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MANAGER, ADMINISTRATIVE AND CLINICAL COMPUTER SYSTEMS

The Department of Radiology is seeking a computer professional experienced in organizational information management to direct, control and plan for the Management and Clinical Computer Systems in Radiology. Demonstrated supervisory skills, systems and applications programming experience in a state-of-the-art DEC environment required. VMS, MUMPS and networking experience strongly preferred. MS Engineering, Computer Science, Math or equivalent will be a real plus, though your BS and heavy pertinent experience may qualify.

SYSTEMS PROGRAMMER

BS Computer Science, two years systems and applications programming on DEC, one year data base management required. Your RSTE/E, BASIC-PLUS and MUMPS experience, particularly with health care applications will be a super plus.

Forward your resume with salary history and requirements to Laurent G. Hahn, HUP Recruitment, 3400 Spruce Street, Philadelphia, PA 19104. An equal opportunity employer, M/F/H.

HUP HOSPITAL OF THE UNIVERSITY OF PENNSYLVANIA

LEAD PROGRAMMER/ANALYST - CICS

McCormick & Company, a Fortune 500 company and a world leader in the manufacturing and marketing of seasonings, flavorings and specialty food products has an opportunity on its Systems Development Staff for a Lead CICS Programmer/Analyst. This position is responsible for leading development projects, providing training and technical direction to the staff, and designing and writing online application programs.

The individual we are seeking should possess eight years of progressively responsible experience as a programmer/analyst of which at least the last four years have been spent programming under Command Level CICS. A thorough knowledge of OS/JCL is required. Familiarity with VSAM, IMS, structured COBOL, TSO/SPF and SDF would be a real plus. A college degree or working toward one is desirable.

We have two IBM mainframes running under MVS/SP 1 with a nationwide communications network operating under CICS supporting over 200 terminals plus several remote minicomputers and RJE stations.

We offer an excellent compensation and benefits package including relocation assistance. If you are looking for a company which encourages technical career growth, send your resume with salary history in confidence to:

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Manager, Human Relations
Management Services Division
McCormick & Company Incorporated
414 Light Street
Baltimore, MD 21202

AN EQUAL OPPORTUNITY EMPLOYER M/F/H

FACULTY POSITION

Albright College is continuing to invite applications for a new faculty position in Computer Science. Candidates must be qualified in two or more of the following areas: assembly and machine language, operating systems, data base theory, computer organization, theory of programming languages. Doctorate in computer science or a closely related area preferred, but masters degree will be considered; relevant professional or industrial experience desirable. Strong commitment to undergraduate teaching in a liberal arts college and excellent communication skills are mandatory.

Computer Science at Albright is an established major field of study based on ACM Curriculum '78 recommendations. The college curriculum includes a broad general studies program and emphasizes critical thinking and communicative skills.

Position available September 1984. Send resume by April 30 to: Mrs. Donna McClelland, Department of Mathematics and Computer Science, Albright College, P.O. Box 516, Reading, PA 19603.

Albright College is an Equal Opportunity/ Affirmative Action Employer

We are expanding the staff of our computer systems department which has created three immediate openings.

Application Manager

You will oversee the development and installation of software modifications to our Atex system which is used for text processing, advertising tracking and billing. Your responsibilities will include working with user departments in developing personal computer applications, especially financial data collection. You should have programmer/analyst experience with a PDP-11 or VAX installation using Macro-11 or Pascal. Atex experience preferred; accounting/billing system experience a big plus.

Atex Advertising System Specialist

You will be an advertising system support person for our systems group. Your responsibilities will include assisting users of our Atex advertising/billing system with reports, format writing and training. Atex experience preferred, familiarity with advertising procedures a must.

Personal Computer Support Specialist

You will work with our growing number of in-house personal computer users who are using mostly DEC Rainbows. Your full-time responsibility will be to assist these users with spreadsheets, word processing, answer questions and training. Experience with PC's required and a willingness to work with a variety of user requests.

To apply for any of the above, send your resume or a detailed letter, including salary requirement, to Tom Pfau, Corporate Systems Manager, CW Communications, Box 880, Framingham, MA 01701. No phone calls, please.

We are the world's largest publisher of computer-related newspapers and magazines, including ***Computerworld*** and more than three dozen other publications around the world. We offer pleasant working conditions in modern offices adjacent to the Mass Pike, excellent benefits including dental and optical and profit-sharing. We are an equal opportunity employer.

CW COMMUNICATIONS/INC.

DATABASE APPLICATIONS PROGRAMMER

Staff position for development and support of relational database applications in administrative offices of the Department of Electrical Engineering and Computer Science. Duties will include design and coding of new applications; maintenance and enhancement of existing management information systems; documentation of applications packages; advising and assisting users. Provides opportunity to work in an academic environment, to help develop management tools, and to gain experience in analyzing nonstandard requirements and structuring workable solutions. Interest in working closely with users essential. Professional programming experience required. Database and PL/I experience especially helpful. Bachelor's degree preferred. Multics experience helpful.

Applicants should send resume, statement of professional goals, and names of references to the address below. No agencies.

Prof. F.C. Hennie
Room 38-435
Massachusetts Institute of Technology
77 Massachusetts Avenue
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404-971-7281

The City Colleges of Chicago, Programs for the Military-Europe is seeking applicants for its full-time faculty. Bachelor's Degree in Data Processing or Computer Science is preferred. Teaching experience is required. Must be able to teach two or more of the following languages: COBOL, FORTRAN, PASCAL, BASIC, ASSEMBLER or other languages. The City Colleges of Chicago is an Equal Opportunity Employer. Send credentials and resume to:

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DBD Systems, Inc., a world-wide leader in data base consulting and education, offers this career opportunity to highly qualified professionals. Data base design and systems development experience utilizing ADABAS, IDMS, or IMS/VS is essential. Education experience, and ability to communicate effectively, both verbally and in writing, is a definite plus.

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Data Processing

DATA PROCESSING DIRECTOR

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Major new applications and systems development efforts offer a broad range of applications for our sophisticated and multi-processor Univac 1100/80 site. New systems are being developed in such areas as **general ledger, human resources, flight crew management, aircraft forecasting, passenger and cargo revenue accounting, automated check-in, and flight planning.** If you have 2 or more years of experience in one of the following areas we are interested in talking with you.

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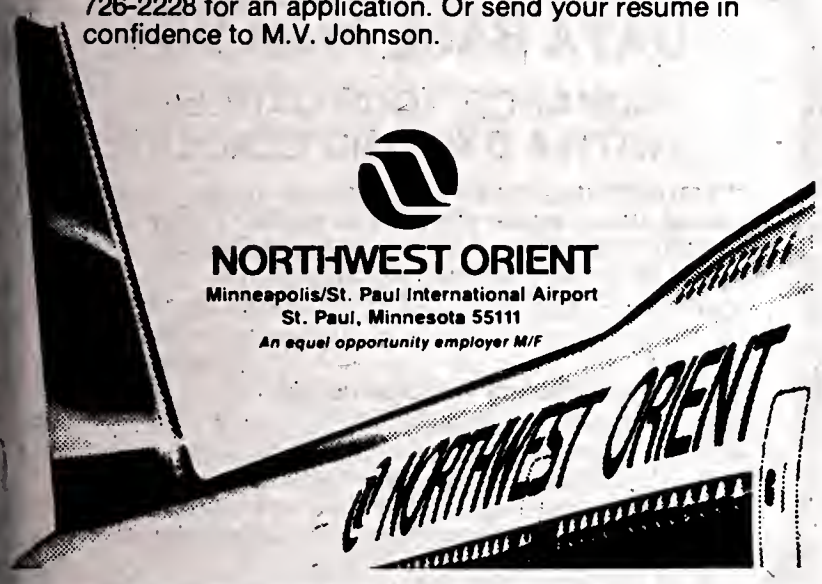
Candidates should hold a degree in computer science, management information systems or quantitative methods, plus expertise in COBOL, FORTRAN and/or MAPPER. Experience in a Univac 1100 environment and DMS 1100 or similar data base management system is a plus.

SYSTEMS PROGRAMMERS

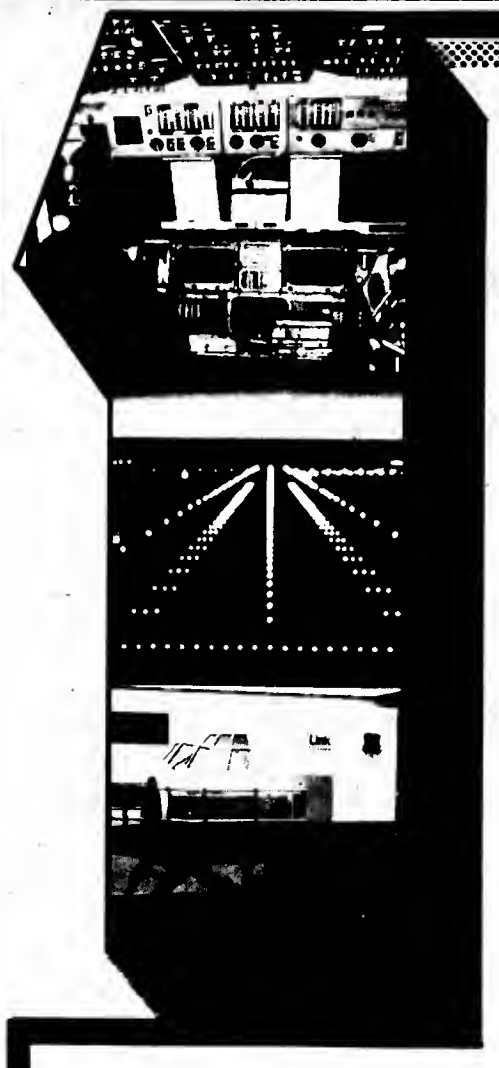
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RESPONSIBILITIES: Will perform system engineering trade-offs for telemetry and network systems. Produce design specifications and requirements documentation. Integrate design into a total simulator product.

REQUIREMENTS: Bachelor's Degree in related discipline. Strong background in telemetry and network systems in simulation. Requires exposure to TDRS, NASCOM and Air Force RTS systems and hardware. Knowledge of simulation techniques and programming in hardware solutions. Capable of integrating hardware/software and document design and requirements to applicable military standards. Must have 2 to 10 years related experience.

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SYSTEMS PROGRAMMER
NOVA UNIVERSITY
Fort Lauderdale, Florida

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- Minimum of 3 years supervisory and managerial experience.
- Experience with the design and development of data base management systems.
- Knowledge of financial/administrative systems.
- Experience with telecommunication networks.
- Good communication and interpersonal skills.

Applicants for the position of Systems Programmer should have the following qualifications:

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- Knowledge of telecommunication networks and communication protocols.
- Experience with "C" and UNIX highly desirable.

Salary commensurate with experience and qualifications. Send resume ASAP to:

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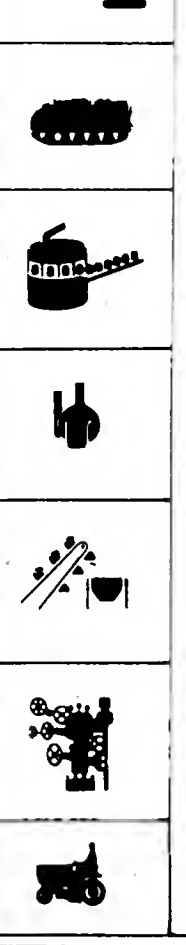
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computer services manager

FMC Central Engineering Laboratories is an interactive, multidisciplinary research center chartered to provide technical services and identify new product opportunities for the defense, petroleum and specialized machinery divisions of FMC.

A unique opportunity exists for a Computer Services Manager to guide and direct the activities of the Computer Services department which supports our research laboratory in the areas of MIS, technical computing and office automation. Your specific responsibilities will include supervising the operations of each support department, determining the best utilization of existing and new hardware and participating in the Technical Computing Steering Committee for planning and implementation of our strategic objectives.

The successful candidate will have a B.S./M.S. in Computer Science or Engineering and be experienced in managing a department of similar scope. A thorough knowledge of DEC equipment and up-to-date familiarity with technical computing software, IBM MIS Systems and office automation options and systems are required. Strong interpersonal skills are essential to work effectively with your client, user community.

FMC offers competitive salaries and excellent benefits. For confidential consideration, please submit resume or call: Ms. V. Payne, (408) 289-3433, FMC Corporation, Central Engineering Laboratories, 1185 Coleman Avenue, Santa Clara, CA 95052. We are an equal opportunity employer m/f.

FMC

IBM 4381
Database Administrator

The Royal Oman Police is an expanding and progressive Force with wide ranging responsibilities including Customs and Immigration. Micros, Minis and Word Processors are already in use and an IBM 4381 is due for delivery in July.

The newly expanded Computer Department has a vacancy for a Database Administrator. Applicants for this post must have a minimum of 8 years IBM experience of which at least 3 years must have been as a Database Designer or Database Administrator in an online realtime IMS/CICS environment. Applicants must have been responsible for the design and implementation of at least one large and complex IMS/CICS database.

This appointment is offered on contract terms of service for an initial period of 2 years. Conditions of service include tax-free annual emoluments of the equivalent of approximately U.S.$34,087/- at the current rate of exchange, and normal benefits associated with working overseas including furnished air-conditioned family accommodation, car and medical treatment, with 60 days leave per annum and an end of contract benefit equivalent to 25% of the basic salary.

Applications with detailed curriculum vitae attached should be forwarded, not later than 20 April, 1984 to:

Inspector General of Police and Customs, Attn: Assistant Inspector General (P), C/O Gregg International, P.O. Box 11618, Kansas City, MO 64138.

Aircraft Division

COMPUTER SYSTEMS ENGINEERING

At Northrop Aircraft Division, Computer Systems Engineering is a small group of Senior Analysts who are planning the systems architecture that will support the division through the end of this century. This is a select group whose size and influence is such that each individual member's contribution will make a definite impact on the division's operations. We are currently seeking senior specialists in Network Configuration Planning who can address systems that run from multi-mainframe area networks to mini/micro distributed processing.

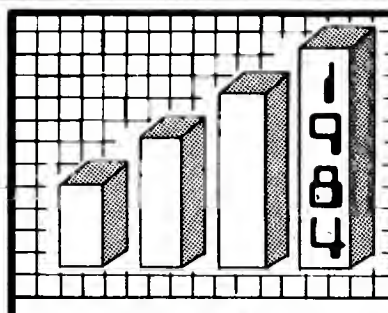
Aircraft Division Data Processing is one of several information resource management teams that daily support the phenomenal growth of Northrop's Southern California Divisions. Interested candidates should forward resume and salary requirements to:

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SR. PROGRAMMER ANALYSTS—6+ years experience in applications development with high technical proficiency in COBOL.

PROGRAMMER/PROGRAMMER ANALYSTS—2-5 years experience in applications development using COBOL.

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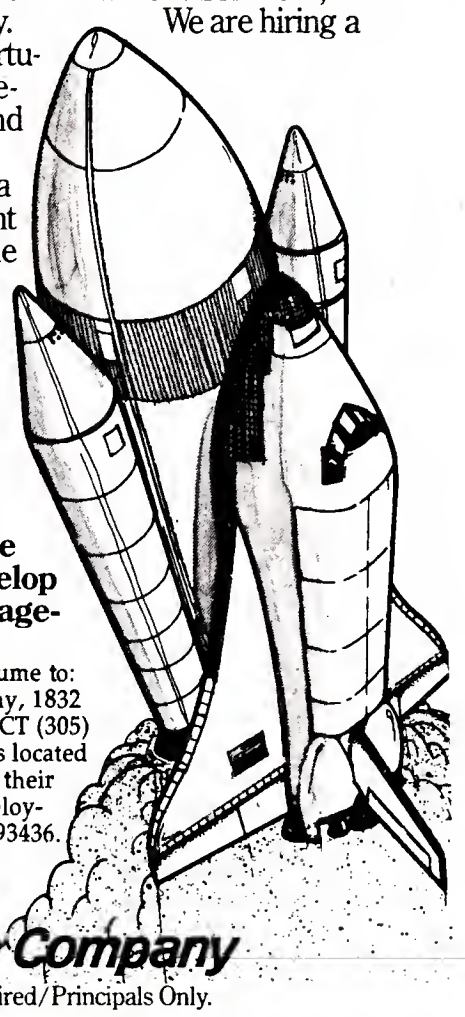
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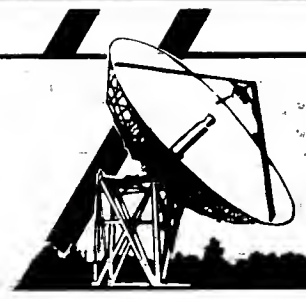
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City of Colorado Springs, Dept. of Personnel, Attn: Data Systems Manager, P.O. Box 1575, Colorado Springs, CO 80901.

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Data Processing

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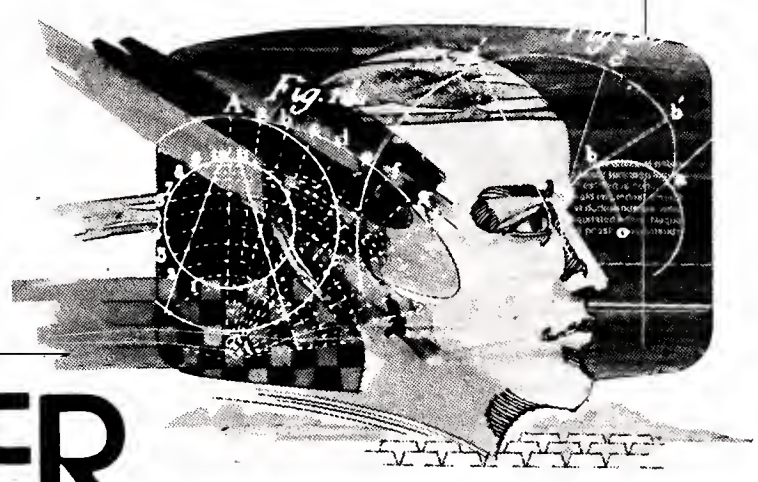
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DATA BASE SYSTEMS MANAGER

New Mexico State University seeks a person with a minimum of two years in-depth, technical experience in DBMS work to develop and implement such an environment. Experience is preferred in CCA's Model 204, ADABAS, or other inverted DBMS systems and should be supported by a total of six years overall experience in administrative data processing. Position provides a unique opportunity to join and lead team already experienced in On/Line systems in payroll/personnel and student records. Masters degree is suggested but a B.A. or B.S. degree is acceptable with additional experience. Salary: $32,000-$36,000. Liberal fringe benefits including 22 days annual leave per year. NMSU has excellent computer related degree programs. NMSU has a large Center with two major computers, an AMDAHL 470 V/5 and V/6. It is an MVS/JES 3 environment with VM/CMS for interactive services. Almost all administrative systems On-/Line. Interested candidates send resume to: **Dr. Joseph R. Denk, Director of Computer Center, Box 3AT, New Mexico State University, Las Cruces, NM 88003.** Deadline for applications: April 25,1984. NMSU is An Equal Opportunity/Affirmative Action Employer

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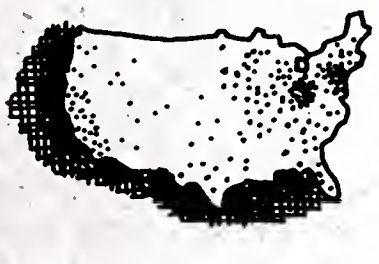
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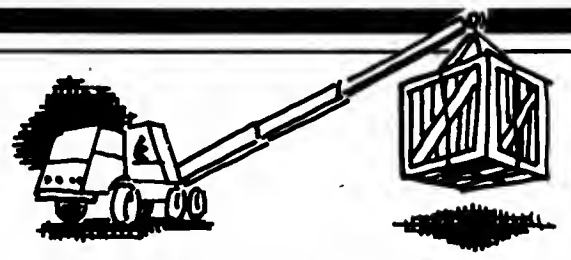
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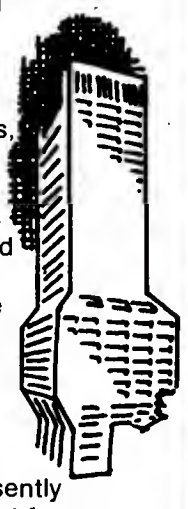
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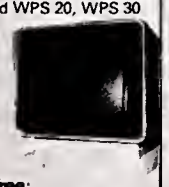
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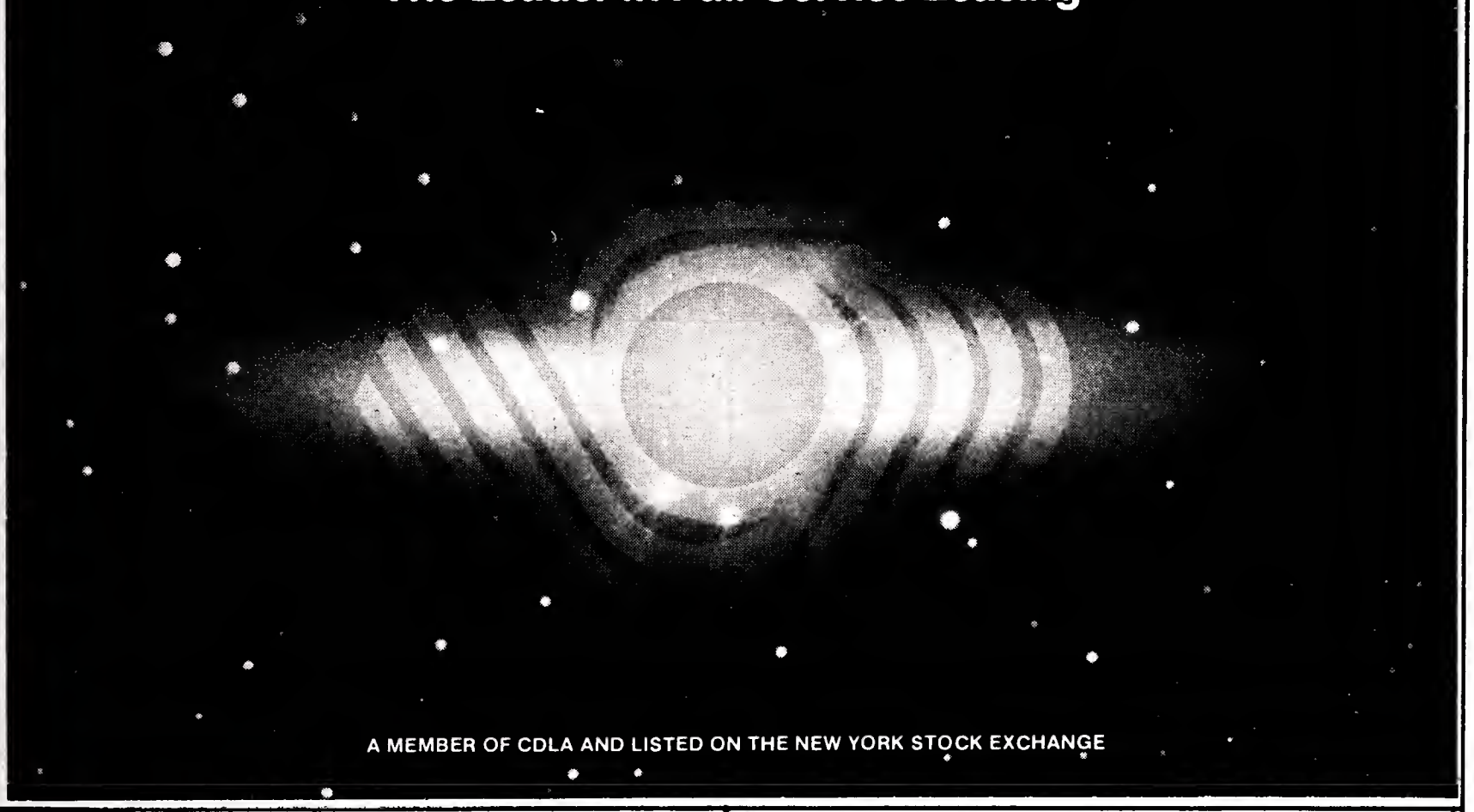
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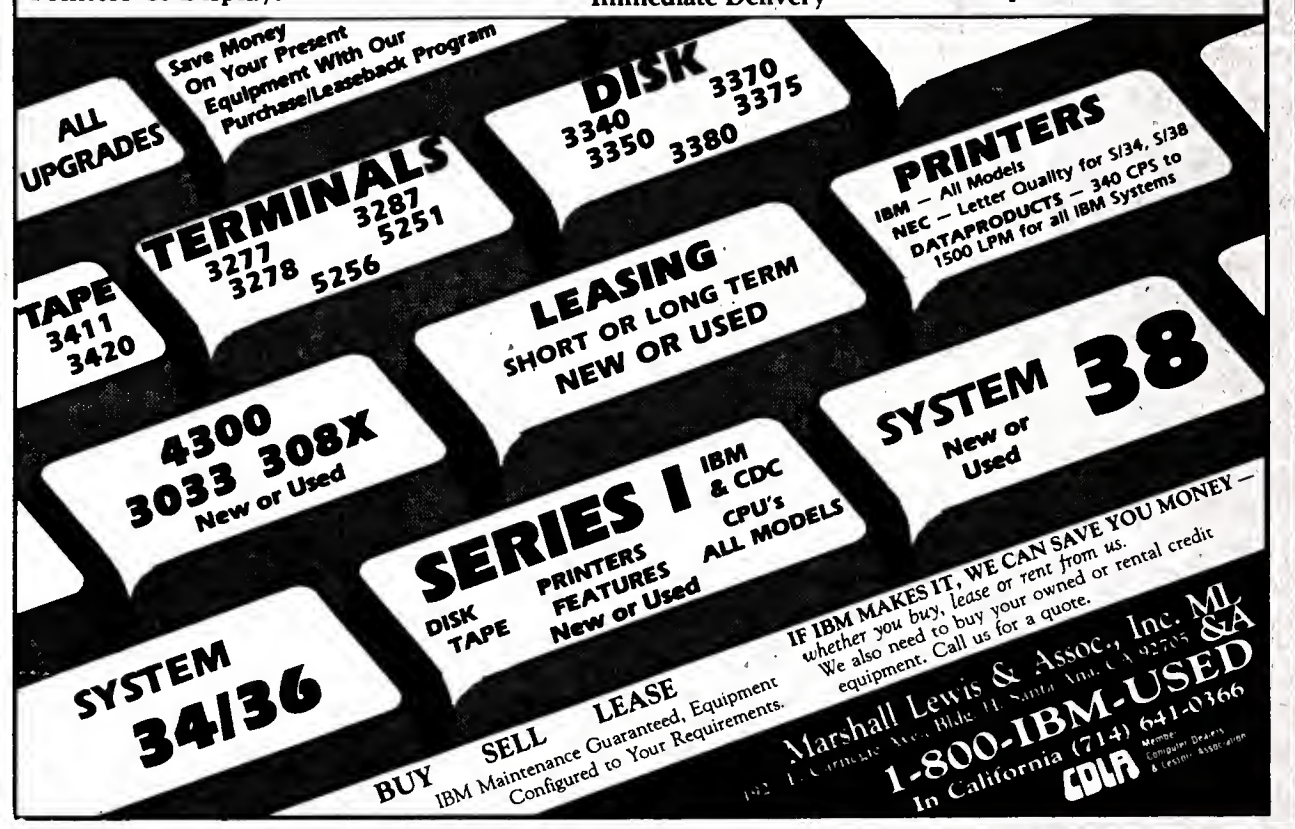
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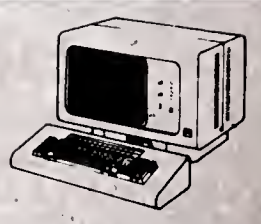
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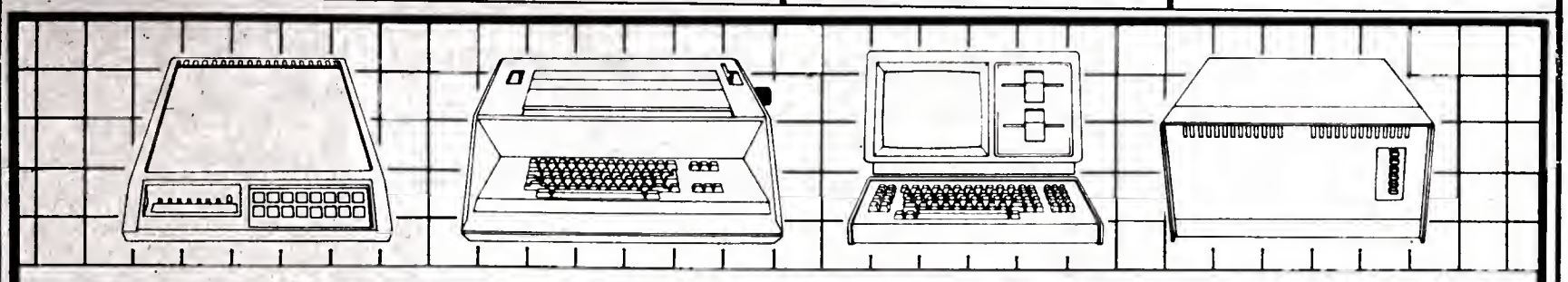
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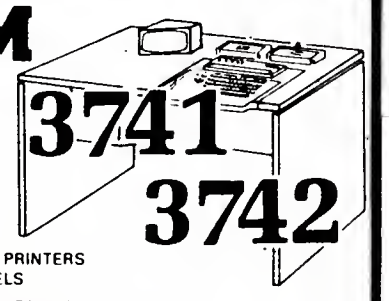
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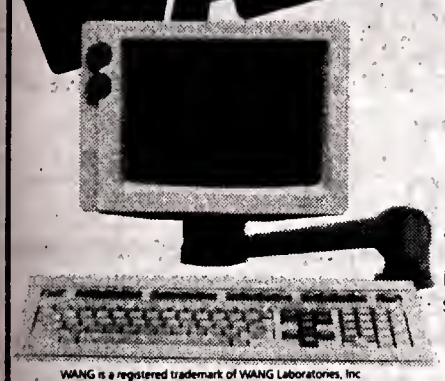
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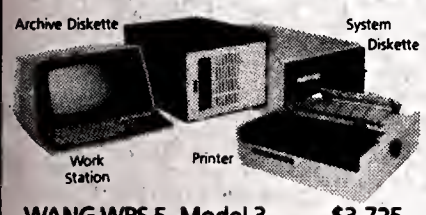
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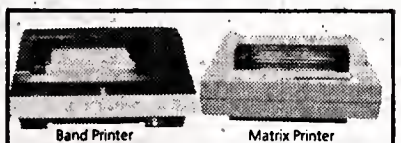
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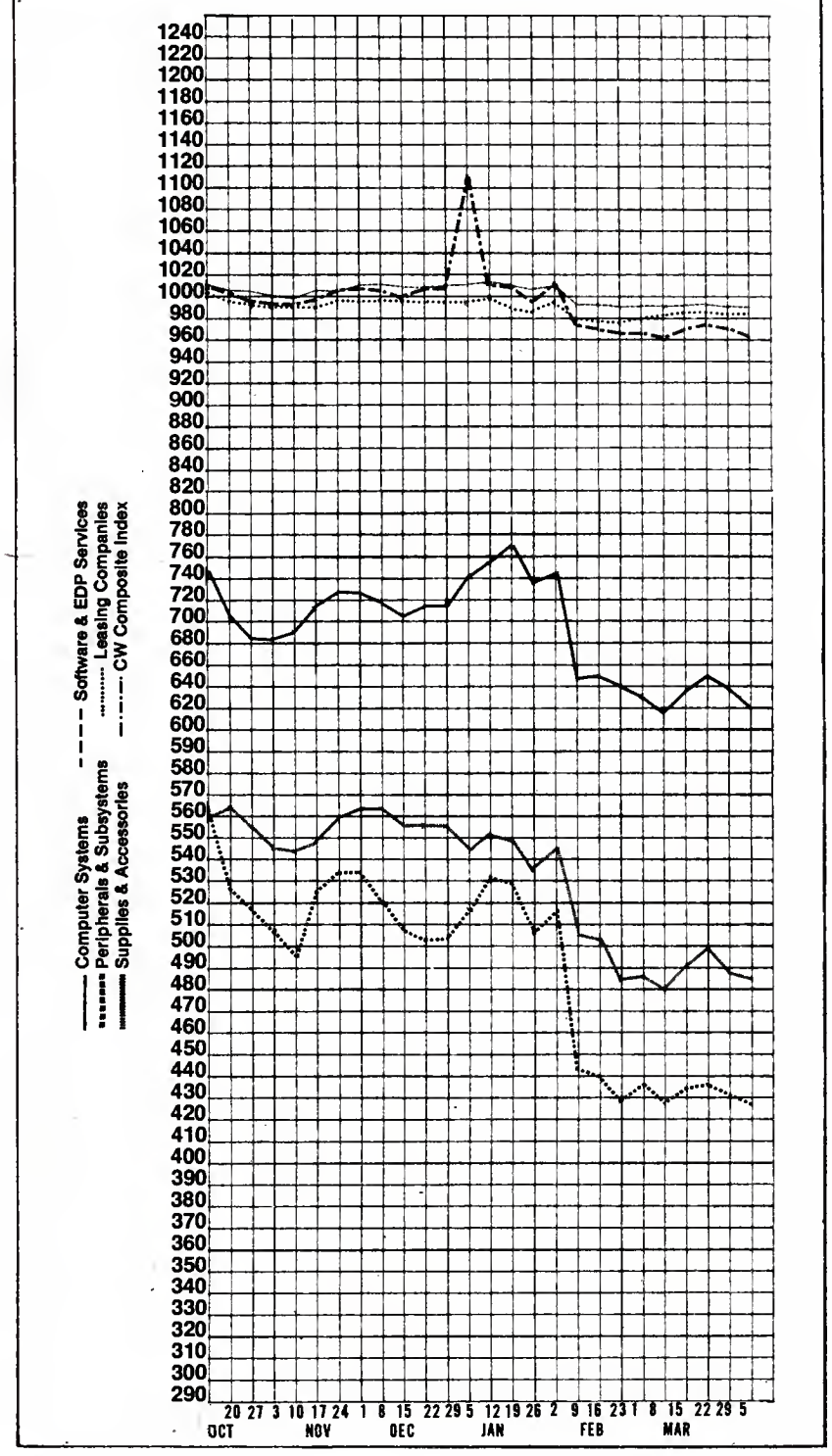
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Computerworld can be purchased on 35 mm microform through University Microfilm Int., Peridolcal Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. *Computerworld* is indexed: write to Circulation Dept. for subscription information.

Computerworld Stock Trading Index



TRADE QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, APRIL 4, 1984

All statistics compiled, computed and formatted by TRADE QUOTES, INC Cambridge, Mass. 02139

EXCH		1983-84 RANGE (1)	CLOSE APR 4 1984	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
O	ALPHA MICROSYSTEMS	11- 24	13 3/4	-1 1/4	-8.3
O	ALTOS COMPUTER SYST	8- 28	11 3/4	+ 1/4	+2.1
A	AMDAHL CORP	30	13 3/8	-1 1/8	-7.7
O	APPLE COMPUTER INC	18- 63	24 1/2	-1	-3.9
N	AT&T	16- 70	15 3/4	0	0.0
N	BURROUGHS CORP	28- 58	50 1/4	- 1/8	-0.2
O	COMPUTER AUTOMATION	6- 17	8	+ 1/4	+3.2
A	COMPUTER CONSOLES	8- 26	18 3/4	- 1/8	-0.7
N	CONTROL DATA CORP	21- 62	36	-2 1/4	-5.8
O	CONVERGENT TECHNOL	14- 41	14	-1 1/2	-9.6
N	CRAY RESEARCH INC	20- 58	43 7/8	+1 1/8	+2.6
N	DATA GENERAL CORP	10- 48	46 3/8	- 1/8	-0.2
N	DATAPOINT CORP	11- 36	22 3/4	-2 1/2	-8.9
N	DIGITAL EQUIPMENT	62-132	87 1/4	-4 5/8	-5.0
A	EECO INC	6- 16	14 1/4	- 1/2	-3.3
N	ELECTRONIC ASSOC.	5- 15	5 7/8	0	0.0
N	FLOATING POINT SYST	13- 44	17	+ 3/4	+4.6
N	FOXBORO	22- 47	31	+ 1/4	+0.8
O	GENERAL AUTOMATION	3- 16	9 3/4	- 5/8	-6.0
N	GOULD INC	26- 44	28 5/8	-1	-3.3
N	HARRIS CORP	20- 51	29 7/8	- 1/4	-0.8
N	HEWLETT-PACKARD CO	22- 48	33 5/8	-3 1/4	-8.8
N	HONEYWELL INC	28- 69	55 3/4	-1 1/4	-2.1
N	IBM	57-134	111	-4 3/8	-3.7
O	IPL SYSTEMS INC	4- 14	4 3/4	0	0.0
N	M/A-COM INC	13- 35	14 1/4	- 7/8	-5.7
O	MAGNUSON COMP SYSTS	1- 5	3/8	0	0.0
N	MANAGEMENT ASSIST	7- 26	23 7/8	+ 7/8	+3.8
N	MATSUSHITA ELEC(ADR)	47- 88	87 1/2	+2 1/2	+2.9
N	MODULAR COMPUTER SYS	6- 16	7 1/4	+ 1/2	+7.4
N	MOHAWK DATA SCI	10- 19	9 5/8	- 3/8	-3.7
N	MOTOROLA INC	82-148	113 5/8	-3 7/8	-3.2
N	NAT'L SEMICONDUCTOR	13- 60	13 3/4	- 5/8	-4.3
N	NBI INC	18- 51	18 5/8	-1 1/4	-6.2
N	NCR	39-136	108 7/8	-4 1/8	-3.6
N	PERKIN-ELMER	17- 37	26	-1 3/4	-6.3
N	PRIME COMPUTER INC	11- 30	15 5/8	-1 7/8	-10.7
N	SPERRY CORP	21- 50	39 7/8	-2 1/8	-5.0
O	TANDEM COMPUTERS INC	14- 40	27	-4 1/2	-14.2
N	TANDY CORP	31- 65	33 1/2	+2 3/4	+8.9
O	TELEVIDEO SYSTEMS	11- 41	13 1/4	-1 1/4	-8.6
O	TELXON CORP	8- 16	8 1/4	- 1/2	-5.7
N	TEXAS INSTRUMENTS	71-176	134 1/8	-5 7/8	-4.1
A	ULTIMATE CORP	8- 24	17 1/4	- 1/8	-0.7
O	VECTOR GRAPHICS INC	2- 14	1 7/8	+ 1/8	+7.1
A	WANG LABS "B"	13- 42	24 3/4	-2 1/4	-8.3
A	WANG LABS "C"	11- 42	24 1/2	-3	-10.9
N	XEROX CORP	35- 52	40 3/8	-1 7/8	-4.4
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	11- 42	39	-1 1/2	-3.7
N	COMDISCO INC	7- 42	12 7/8	- 5/8	-4.6
O	CONTINENTAL INFO SYS	3- 16	7	0	0.0
N	OPF INC	5- 15	13 1/4	+.1/2	+3.8
O	SELECTERM INC	13- 21	12 3/4	- 1/2	-3.7
N	U.S. LEASING	18- 47	31	+1 5/8	+5.5
	COMPONENTS				
N	ADVANCED MICRO DEV	13- 37	27 5/8	-2	-6.7
O	ADV'D SEMICONDUCTOR	12- 38	25	0	0.0
N	ANALOG DEVICES INC	18- 42	27 7/8	-3 1/2	-11.1
O	ANALOGIC CORP	18- 27	18 1/2	-1 1/4	-6.3
N	APPLIED MAGNETICS CP	15- 37	17 5/8	- 5/8	-3.4
N	TERADYNE	14- 39	27 3/4	-1 1/2	-5.1

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON;
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

EXCH		1983-84 RANGE (1)	CLOSE APR 4 1984	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 8	3	0	0.0
O	ADVANCED SYSTEMS INC	6- 22	16 7/8	- 7/8	-4.9
O	AGS COMPUTERS INC	7- 32	19 1/2	-1	-4.8
O	AMERICAN SOFTWARE	14- 31	16 5/8	- 3/8	-2.2
N	ANACOMP INC	3- 23	3 1/8	-1 1/8	-26.4
O	ANALYSTS INTL CORP	5- 20	5 5/8	- 5/8	-10.0
A	APPLIED DATA RES.	8- 37	22	-1 3/4	-7.3
O	ASK COMPUTER SYSTEMS	6- 21	14 1/2	0	0.0
B	ASTRODYNE COMP INC	1- 7	1 7/8	0	0.0
N	AUTOMATIC DATA PROC	21- 44	32 1/4	- 1/2	-1.5
O	CGA COMPUTER ASSOC	5- 17	9 7/8	- 1/4	-2.4
O	COMPUTER ASSOC INT'L	6- 35	19 1/4	-1	-4.9
O	COMPUTER HORIZONS	8- 20	13 1/8	- 1/8	-0.9
O	COMPUTER NETWORK	4- 10	6	0	0.0
N	COMPUTER SCIENCES	11- 23	15	0	0.0
O	COMPUTER TASK GROUP	8- 22	13 1/2	0	0.0
O	COMPUTER USAGE	2- 22	7 1/4	0	0.0
O	COMPUTONE SYSTEMS	5- 38	5 3/4	0	0.0
O	COMSERV CORP	5- 20	5 3/8	- 1/8	-2.2
O	COMSHARE	7- 14	8 3/8	+ 1/4	+3.0
N	CULLINET SOFTWARE	12- 50	33 5/8	+1 1/8	+3.4
O	CYCARE SYSTEMS INC	9- 27	16 1/2	- 1/4	-1.4
N	ELECTRONIC DATA SYST	10- 42	28 5/8	- 1/8	-0.4
O	HOGAN SYSTEM INC	14- 27	16 1/4	+ 1/2	+3.1
N	GENERAL ELECTRIC CO	45- 59	53 3/4	- 7/8	-1.6
N	GTE CORP	36- 48	37 1/4	+1	+2.7
N	INFORMATICS INC	10- 34	19 1/2	- 1/8	-0.6
O	INFOTRON SYSTEMS COR	25- 43	29 3/4	- 3/4	-2.4
B	KEANE ASSOCIATES	4- 15	7 1/4	0	0.0
A	LOGICON	8- 31	20	-1 5/8	-7.5
O	MCI COMMUNICATIONS	8- 34	8 1/8	- 3/4	-8.4
O	MNGT SCI AMER INC	8- 33	16 1/2	+1	+6.4
O	MATHEMATICAL APP GRP	8- 22	8 1/2	0	0.0
O	MICOM SYSTEMS INC	25- 50	36 3/8	-1 5/8	-4.2
O	MONCHIK-WEBER CP	8- 22	9 5/8	-1 7/8	-16.3
O	NATIONAL DATA CORP	5- 28	17 5/8	+ 1/4	+1.4
O	ON-LINE SOFTWARE INT	8- 27	12	+4	+50.0
O	PANSOPHIC SYSTEMS	8- 30	13 1/4	+ 1/2	+3.9
N	PLANNING RESEARCH	6- 21	12 3/4	- 5/8	-4.6
O	POLICY MGMT SYSTS CP	15- 35	24	0	0.0
O	PROGRAMMING & SYS	1- 8	4 3/4	0	0.0
O	REYNOLDS & REYNOLD	17- 53	32 3/4	-1 1/4	-3.6
O	SEI CORP	11- 34	15 3/8	-1 5/8	-8.5
O	SHARED MEDICAL SYST	13- 43	25 3/4	+1 5/8	+6.7
O	SCIENTIFIC COMPUTERS	6- 14	8	- 1/4	-2.7
O	SOFTWARE AG	5- 17	13 7/8	+ 7/8	+6.7
N	TYMSHARE INC	12- 30	25	+ 3/8	+1.5
A	URS CORP	5- 18	12 5/8	- 3/8	-2.8
N	WYLY CORP	7- 17	10 7/8	+ 3/8	+3.5
	PERIPHERALS & SUBSYSTEMS				
P	AM INTERNATIONAL	2- 7	3	- 1/8	-3.9
A	ANDERSON JACOBSON	7- 26	8 3/4	- 1/8	-1.4
O	AUTO-TROL TECHNOLOGY	8- 29	16 1/2	-1 5/8	-8.9
O	BANCTEC INC	7- 33	8 1/4	- 5/8	-7.0
A	BEEHIVE INT'L	4- 15	5 3/4	- 1/2	-8.0
N	BOLT,BERANEK & NEW	5- 30	18 3/8	+ 1/8	+0.6
O	CAMBEX CORP	1- 4	1 3/8	0	0.0
N	CENTRONICS DATA COMP	6- 28	12	0	0.0
A	CETEC CORP	4- 12	7 7/8	0	0.0
O	COGNITRONICS	2- 20	8 1/2	- 3/8	-4.2

EXCH		1983-84 RANGE (1)	CLOSE APR 4 1984	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMPUTER DEVICES INC	1- 21	3/4	-	-7.0
O	COMPUTER TRANSCEIVER	3- 12	2 7/8	- 3/8	-11.5
N	COMPUTERVISION CORP	19- 53	34 3/8	- 1/2	-1.4
N	CONRAC CORP	14- 38	18 3/4	+1 3/4	+11.6
A	DATAPRODUCTS CORP	16- 41	23 1/2	-2	-7.8
A	DATARAM CORP	5- 12	9 1/2	- 1/4	-2.5
O	DATA SWITCH CORP	13- 41	16 1/2	-1 1/2	-8.3
O	DATUM INC	2- 17	7 5/8	- 1/4	-3.1
O	DECISION DATA COMPUT	3- 16	10 1/8	- 3/8	-3.5
O	DOCUTEL-OLIVETTI	7- 39	7 3/8	-1 1/2	-16.9
N	ELECTRONIC M & M	5- 11	6 3/4	+ 1/2	+8.0
O	ENDATA, INC	10- 16	9 3/4	- 1/2	-4.8
O	EVANS & SUTHERLAND	17- 50	18	+ 3/4	+4.3
O	GANDALF TECHNOLOGIES	9- 22	10 7/8	- 1/8	-1.1
N	GEN'L DATA COMM INC	6- 33	29 1/4	+1	+3.5
O	GREAT SOUTHWEST INC	1- 6	7/8	0	0.0
N	HAZELTINE CORP	7- 31	27 1/8	+2 1/2	+10.1
O	ICOT CORP	3- 10	3 3/4	+ 1/4	+7.1
O	INFORMATION INTL INC	10- 22	12 1/2	- 3/8	-2.9
O	INFORMATION SCIENCE	8- 17	8 3/4	0	0.0
O	INTEL CORP	11- 45	32 1/2	-4	-10.9
O	IPL SYSTEMS INC	4- 14	4 3/4	0	0.0
A	LUNOY ELECTRONICS	7- 19	10 3/4	+1 1/4	+13.1
O	MEGADATA CORP	9- 15	9 1/2	0	0.0
A	MSI DATA CORP	16- 37	16 1/2	- 1/8	-0.7
N	NASHUA CORP	9- 29	23 3/4	+1 3/4	+7.9
O	NETWORK SYSTEMS CORP	8- 34	17 7/8	-2 1/4	-11.1
N	NO AMERICAN PHILIPS	17- 40	33 1/2	+ 1/8	+0.3
N	NORTHERN TELECOM LTD	22- 49	33 1/4	+ 1/4	+0.7
O	OMEX	1- 6	1/4	0	0.0
N	PARADYNE CORP	13- 30	15 5/8	+ 1/4	+1.6
A	PENRIL CORP	7- 14	11 7/8	- 1/8	-1.0
O	PHOENIX AMERICAN INC	7- 17	8 1/4	- 1/4	-2.9
N	PLESSEY CO (ADR)	26- 41	32 1/4	-2	-5.8
O	PRINTRONIX INC	20- 34	21 3/4	-1 3/4	-7.4
O	RAMTEK CORP	9- 26	9	- 1/2	-5.2
N	RAYTHEON CO	36- 58	37 3/4	+ 3/8	+1.0
N	RECOGNITION EQUIP	4- 17	14 5/8	+ 1/4	+1.7
N	ROLM CORP	33- 80	34 7/8	+ 5/8	+1.8
N	SANDERS ASSOCIATES	36-120	37 1/2	+ 1/2	+1.3
O	SCAN DATA	1- 3	5/8	0	0.0
O	SCAN-TRON CORP	12- 19	14 1/4	+ 1/4	+1.7
N	SCIENTIFIC ATLANTA	10- 23	10 3/8	- 1/8	-1.1
N	STORAGE TECHNOLOGY	10- 33	9 7/8	- 7/8	-8.1
O	SYKES DATATRONICS	3- 27	3	- 1/8	-4.0
O	SYSTEMS & COMP TECH	20- 39	22 1/2	-1 1/4	-5.2
A	T BAR INC	7- 17	9	+ 3/4	+9.0
A	TAB PRODUCTS CO	5- 20	16 3/8	+ 1/2	+3.1
O	TANDON CORP	13- 35	12 3/4	- 1/2	-3.7
A	TEC INC	6- 12	9 1/2	+ 5/8	+7.0
N	TEKTRONIX INC	34- 87	61 5/8	- 5/8	-1.0
N	TELEX	5- 32	21 3/8	- 3/8	-1.7
O	TESDATA SYSTEMS CP	3- 17	5 5/8	0	0.0
N	TIMEPLEX INC	7- 29	15 1/4	-1 3/4	-10.2
O	VISUAL TECHNOLOGY	9- 26	10 1/4	0	0.0
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	7- 23	19 5/8	- 1/4	-1.2
N	BARRY WRIGHT	13- 33	24 5/8	- 3/8	-1.5
A	DUPLEX PRODUCTS INC	12- 27	24 1/8	+ 3/8	+1.5
N	ENNIS BUS. FORMS	6- 28	19 1/4	+ 1/8	+0.6
N	3M COMPANY	49- 90	71 1/8	-3 3/8	-4.5
N	MOORE CORP LTD	26- 51	35 5/8	- 7/8	-2.3
O	STANDARD REGISTER	11- 34	31 3/4	+1	+3.2
N	WALLACE BUS FORMS	11- 33	26 3/8	- 5/8	-2.3

Only MSA software makes your mainframe work 100 times better



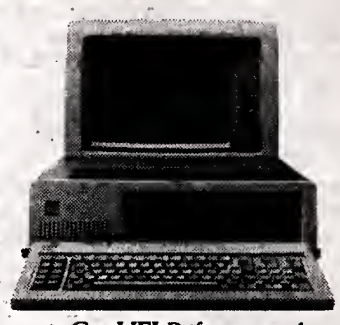
1. Now MSA's Executive Peachpak™ II software links personal computers to the mainframe. So you can...



2. Use your PC to access all your MSA mainframe systems, from General Ledger to Manufacturing.



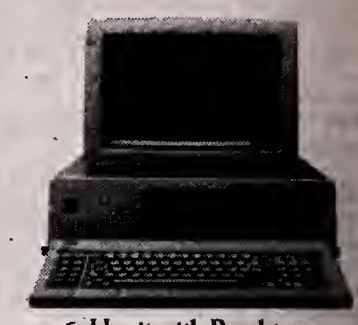
3. Access entire mainframe files, so you can work with large amounts of information at one time.



4. Get HELP if you need it, with a built-in feature that guides you through the system.



5. Choose the exact mainframe information you need, as much as you need, in the form you need.



6. Use it with Peachtree Software, 1-2-3™ from Lotus, DIF,™ VisiCalc™ or other micro software.



7. Enjoy a realtime environment, no waiting for processing.



8. Allow only authorized personnel access to the mainframe, due to built-in security.



9. Get database-to-database transfer with Database Sharing.



10. Use over 20-predefined applications from MSA. For example...



11. Use PeachLink™ to download information from both MSA and non-MSA online mainframe systems.



12. Download vendor history from MSA's Accounts Payable System and use PeachCalc™ to do comparative analysis.



13. Print checks in remote locations from mainframe Accounts Payable data.



14. Create a salary administration worksheet on a PC using MSA's Payroll/ Personnel System.



15. Make a purchase order adjustment without leaving your workstation.



16. Download current balances from General Ledger to graph actual vs. planned.



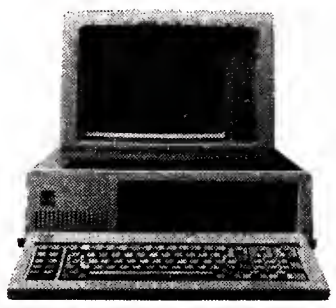
17. Capture data from MSA's Fixed Assets System, use PeachCalc™ to create a lease amortization model.



18. Access available funds data in MSA's Budgetary Control System...



19. Use PeachCalc™ to project expenditure through year-end.



20. Use MSA's Manufacturing System data to produce cost/margin analysis with PeachCalc.™



21. Dial up subscriber databases to access current credit information for customers...



22. Use PeachCalc™ to analyze information, set credit and update your mainframe Accounts Receivable data.



23. Install it in less than one hour.

Send for our free brochure, and find out all 100 ways to increase your productivity.

24. -100.

Backlogs? Rush requests? Now they're a thing of the past.

MSA's new Executive Peachpak II links your company's personal computers directly to your mainframe. So executives can get to vital information without waiting for print-outs.

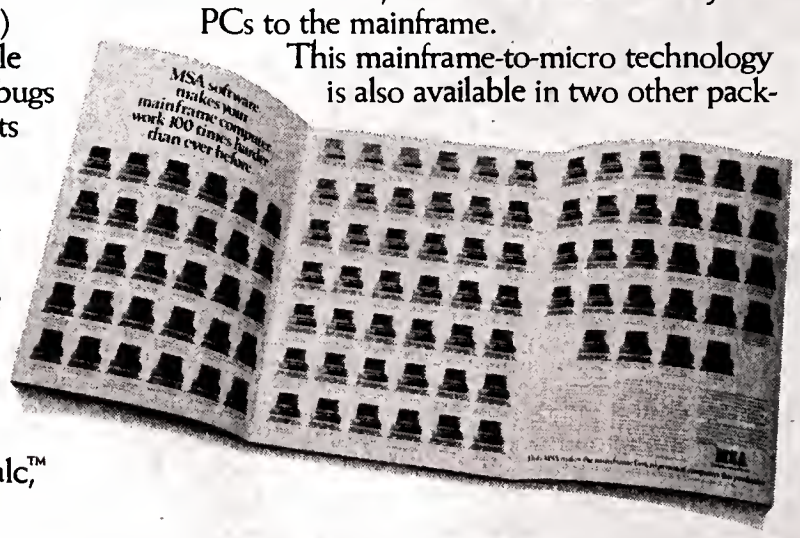
Best of all, this hot new technology is available from MSA *right now.* (In fact, it's already installed and working for companies across the country.)

MSA is the mainframe-to-micro leader. While other companies are still trying to work the bugs out of their initial offerings, MSA already has its *second* successful mainframe-to-micro product: Executive Peachpak II.

It offers such advanced features as Database Sharing, MSA's database-to-database transfer technology that lets you get all the mainframe information you need instantly.

And a Universal Interface with most microsoftware packages including Peachtree Software, 1-2-3™ from Lotus, and VisiCalc.™

Executive Peachpak II also includes PeachCalc,™ an electronic spreadsheet. A Business Graphics System for color charts and other graphics. Telecommunications that let personal computers talk to each other—or link to resources such as Dow Jones News/Retrieval.® PeachText,™ complete report production system that lets executives edit and footnote reports. A List Manager for organization. And PeachLink,™ the software that links your PCs to the mainframe.



This mainframe-to-micro technology is also available in two other packages: Administrative Peachpak, which includes comprehensive word processing functions. And Graphics Peachpak, for color graphs and charts.

All include PeachLink.™ And all are backed by the service and support MSA is so famous for.

This revolutionary new link means you can now deal with one software company that supplies all the advanced mainframe systems your company needs. All the software for your personal computers through our Peachtree Software Company. And the software that links them together.

Talk to MSA about new Executive Peachpak II. And see how much more you could be getting from your mainframe. Call Robert Carpenter at (404) 239-2000, or write to Management Science America, Inc., 3445 Peachtree Road, N.E., Atlanta, Georgia 30326.

MSA
The Software Company

MSA makes the mainframe link to personal computers a reality

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